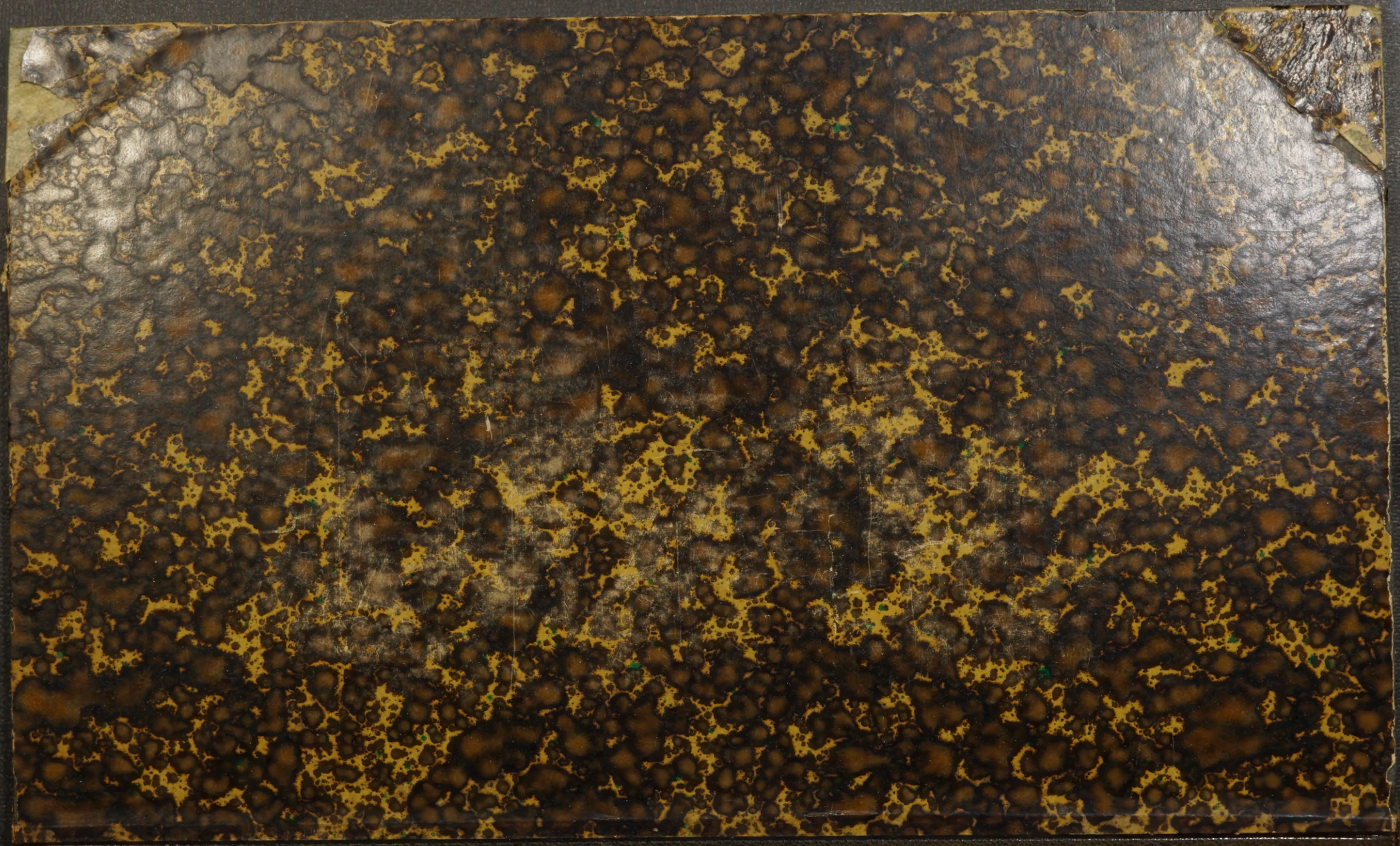

The Clinical Diagnosis OF CARCINOMA OF THE BREAST.

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(With Illustrative Plates.)

THE importance of the early recognition of a carcinoma which has arisen in any part of the body is fully appreciated by the medical profession, as the possibility of successful treatment depends so greatly on the stage at which operation is permitted. At the present time we know of no other method of interference which affords a chance of cure. It might be considered that in an organ which is situated as the breast it would be quite easy to distinguish a malignant from a simple growth, but this is not so in the early stages, especially when the patient is well nourished. Dr. Hort[1] states that 128 out of 300 patients under the age of 25 suffering from disease of the breast were not diagnosed correctly. He makes a further statement that 582 out of 3532 were sent to London hospitals with a wrong diagnosis.

EARLY STAGES OF CARCINOMA OF THE BREAST.

There is no pain in the early stage, when changes in the breast are but slightly marked, and require an expert to interpret them. To this statement there are few exceptions. The majority of patients present themselves when the nature of the disease is evident and the probability of successful treatment by any method doubtful. A series of photographs which have been taken of cases when they first came under observation proves this very decisively. From year to year it has been the same experience in hospital work—few have come unless there has been a change of marked character in the nipple or in the skin over the breast, or unless a pain has become so insistent that it can no longer be tolerated. In most of these advanced cases there was no loss of flesh, and the general appearance of the patients was unaltered.

A small proportion say that they did consult someone when they first felt a lump in the breast, but that they were reassured as to its nature—as it was small, discovered by accident when washing, and did not cause pain, they were told not to trouble any more about it. They were quite satisfied to follow this advice until they noticed an alteration in the appearance of the breast or pain supervened. The opportunity of giving permanent relief may then have passed for ever. Most of us have made mistakes in the diagnosis of carcinoma of the breast in its early stage. Possibly a first opinion was given after insufficient examination, but whatever the reason of the wrong diagnosis, what a tragedy was staged for a later appearance.

It is hoped that some remarks on the clinical aspects of the disease may lead to an earlier application for relief, and less hesitation in giving sound advice. I am inclined to the opinion that there is still too great a disposition to wait for special "text-book" signs. In this way lives are ultimately lost as surely as a man loses his patient with a perforated gastric ulcer if he waits for "loss of liver dullness."

TECHNIQUE OF EXAMINATION.

Every patient who comes with a complaint of something wrong with the breast must be examined thoroughly. Most mistakes are the result of imperfect examination. After preliminary inquiries regarding the duration of the trouble, the way in which it was discovered, the presence or absence of pain, personal and family history should be taken and attention paid to possible causes such as injury and previous disease of the breast. In order to examine the patient satisfactorily it is best to have the chest coverings removed, so that a full view of the part is possible; usually you are offered a keyhole opening with corsets only partly unfastened.

The room should be warm and a covering provided for the shoulders. The hands of the surgeon must not be cold. Look at the chest from the front with the patient standing and the arms hanging naturally by her sides. This gives you opportunity of comparing the two breasts, judging their outlines and comparative size, and changes in the skin and nipple. If the patient lifts her arms above the head, any adhesion to the pectoral fascia will be shown by a simultaneous raising of the affected gland. A satisfactory palpation can be made with the patient lying back in an easy-chair, or in obscure cases when she is recumbent on a couch. The supra-clavicular spaces are most satisfactorily examined when she is sitting in the chair, the examiner standing behind it. The axillary regions can be searched for glandular changes when she is standing, lying, or sitting if the muscular boundaries of these parts are relaxed.

If we suppose a case in which a solitary lump has been noticed in one breast (the woman is over 30 years of age, says that she is in good health, and looks it), on first examination we see no alteration in either, to the eye they both appear normal. The usual questions have to be answered which arise in the consideration of every abnormal swelling: Is it inflammatory in origin; if not, is it solid or fluid: is it simple or malignant? By far the most common of all malignant growths of the breast is carcinoma (scirrhus—spheroidal-celled, especially the atrophic variety). Bryant estimated that 83 per cent. of breast tumours were carcinoma. Commonly a slowly growing tumour of stony hardness, it gradually replaces the mammary tissue, invades surrounding structures, and affects the lymphatic glands.

The patient should be requested to point exactly to the part of the breast in which she has noticed a swelling, and examination should be gently carried out to ascertain if any of the characteristics of scirrhus are present.

First Stage of Tumour.

This may be called the first stage, and it is most important that some decision should be reached as regards the nature of the swelling. The signs which we look for are the hardness of the tumour, especially in its central part, where there may be some nodulation of surface. It is important to note if the outline of the hard area is irregular and fades gradually into the breast substance or is clearly defined. A thinning of the overlying subcutaneous tissue may be noted. There may be no tenderness, but many patients complain of aching at night-time after the examination. In rare instances small scirrhous growths may be rounded and clearly defined, although very hard. They sometimes appear pedunculated, but soon become fixed to surrounding structures. Their want of elasticity should compel suspicion of them. In these there appears to be a definite limiting membrane which for a time resists the usual infiltration of parts adjacent. In coming to a conclusion as regards the signs mentioned it is advisable to place the patient on a couch whilst examination is made. The first two fingers of the left hand should be placed above and below the swelling, whilst the hand steadies the breast over the chest. The tip of the forefinger of the right hand is then placed over the centre of the swelling and the question of fluctuation decided. No other tumours possess the same stony hardness as carcinoma if we except chondro-sarcoma, osteo-chondro-sarcoma, and sclerosing tuberculous mastitis, all very rare conditions.

If a patient comes with a lump which has these characters, it should be explored without undue delay.

Second Stage of Tumour.

There is nothing to signalise the passing from the first to the second stage of carcinoma of the breast, and it is usually in an advanced period of the second stage that patients present themselves. (Mayo says about

25 per cent. are already inoperable.) It may be difficult to find out when the disease really commenced, for so often the sufferers will not admit there was anything before they "accidentally" discovered it. Sometimes, however, they confess to a longer history on closer questioning, say they were afraid it might be cancer, but there was no pain, and therefore they did not like to make a fuss; they may also add that there had been little change, but because it did not go away they felt it might be best to make certain. One patient admitted that she had concealed her trouble from her husband because their finances were low; another said she did not believe in doctors, and therefore had not shown it.

There is one sign which is found comparatively early and which may be present before the skin gives signs of becoming adherent in front, and that is an elevation of the affected breast when the arms are lifted above the head. It is a proof that the tumour has become attached to the fascia over the muscle, and may be demonstrated when the growth appears to be quite unattached to deeper parts on ordinary examination. A growth which has commenced in the posterior part of the breast is the more likely to give this sign, and it is in obscure cases that it is most valuable. Later, an involvement of the pectoral fascia and muscle ensues; the growth may still be movable across the line of the pectoral fibres, but not when an attempt is made to carry it upwards and outwards. Still later it becomes quite fixed whether the muscle be contracted or not.

This fixation to the parts behind the breast may be unaccountably delayed, as shown by the case of a patient, aged 72, seen in consultation on account of recurring hæmorrhage from a large ulcer of the left breast. The tumour had been slowly growing for more than four years, but as it was painless, and the offensive smell when ulceration supervened could be controlled by applications, she had refused medical aid. There was a large lobulated growth of colour varying from red to purple; three of the most prominent lobules were ulcerated. From one of these there had been considerable bleeding for a month which was increasing in severity, so that she was markedly anæmic. The breast was freely movable, and no enlargement of the axillary glands could be felt. Operation afforded much relief, and recovery was uneventful.

The period at which glandular infection occurs is unknown. Experience has proved the danger of not removing the axillary glands in all cases, although disease of them cannot be demonstrated, no matter how recent the history given. It is not an uncommon experience to be told that they are not enlarged, when more careful examination shows that one or more are, but hidden under the anterior axillary fold, or placed high up in the axilla. It is a good plan to engage the assistance of the patient's friend, or medical attendant if present, and have the arm lifted from the side with the shoulder muscles relaxed. The left hand should be used for the right axilla, whilst the surgeon stands on the patient's left side and vice versa. The flat hand is passed to the apex of the axilla and worked slowly downwards along the posterior margin of the pectorals. The other side should then be examined in a similar way. Generally one or more hard glands can be felt, as they escape upwards from under the finger. This examination must be conducted gently, for the part is somewhat sensitive to pressure. Unusual hardness is of more importance than a slight increase in size, the large gland may not be diseased. Always compare the two sides.

Changes in the supraclavicular glands are not manifest in the early stage of most carcinomata of the breast, but may be demonstrated at a later stage or when the disease commenced in the upper segment. In this region the transverse process of the lowest cervical may be mistaken for a gland, also the posterior belly of the omo-hyoid.

One sees occasionally an extensive development of scirrhous growth in the axillary glands, probably in a stout well-nourished patient, when there is no primary lesion to be found in the breast. It is sometimes in the outer margin in what is called by Deaver the axillary tail, hidden by the mass of diseased glands, or it may have had its origin in an accessory mamma. The disease is never primary in the glands; cases are described where the primary growth, which had been overlooked, was situated in a duct, or had commenced as a small ulceration of the nipple (Lockwood).[2] After the examination of the axilla, it is well to look for nodular developments in the lymphatics, which pass between the breast and axillary glands. The glands which are placed between the pectoral muscles cannot be felt by palpation under ordinary conditions; even when the axilla is opened it may be impossible to feel them. Hence, one of the chief reasons for removal of the pectorals in all operations which aim at eradication of the disease. They are seen lying between the muscles after operation in early cases small, but diseased, and it has been necessary to remove the muscles some weeks after amputation of the breast and clearance of the axilla by others, because of renewed growth invading them from the glands. Early extension to the skin, making it adherent, is demonstrated by lifting the overlying skin between finger and thumb, when it dimples. Later it is adherent over a varying area and cannot be lifted, the growth has infiltrated it. Other changes ensue in scirrhus of the atrophic type, and dimples, grooves, and depressions of varying size and shape form. These are shown in photographs, and are present in the great majority of our hospital patients, when they first apply. A groove may be quite extensive, and it is found that the nipple is not only contracted but concealed in it, or the depression may be in the lower part of the breast and of such a shape as to suggest that the pressure of a corset may have had something to do with the causation of the growth. (Fig. 2.) This particular groove is uncommon.

As these changes develop in the skin and subcutaneous tissue, diminution in size takes place in the breast and nipple, the extent of which will vary with the position of the growth and the rate of contraction. In the atrophic form growth may progress very slowly indeed, one of the characteristic features being the small size of the resultant tumour, considering its duration. There appears to be a constant struggle between the fibrous stroma and the cellular elements; the former, prevailing, often prevents the development of a large tumour, causing a destruction of cellular elements, while it destroys the breast, which is replaced by an irregular, sullen, contracting and deforming deposit. The extremely retarded action of these growths is shown in Fig. 3, where the scirrhus had a history of more than 11 years, during which it caused no inconvenience and when removed was not larger than half a bitter almond. It was spheroidal-celled, but the axillary glands were still unaffected.

The nipple in the second stage will be drawn in from its original position and towards the growth, whilst an early sign is that of a cord passing between the two points, probably the result of permeation of a duct. The shape of the areola is changed, being narrowed on the side towards which the nipple is drawn. In the hypertrophic form (Fig. 1) of spheroidal-celled carcinoma where the tumour is more cellular and prominent, the skin is soon infiltrated with cells, which gradually change it into a part of the tumour with alteration in colour and tendency to break down. The nipple may also be much enlarged in every direction and hardened.

Various cystic and other changes may take place in carcinomatous growth, and a mucoid or colloid degeneration develop. A cyst may be formed as the result of breaking down of a quickly-growing tumour. There are also several instances known of the formation of spheroidal-celled carcinoma in what appears to be a simple cyst. The following instance is instructive:—

A married woman, aged 52 years, had a two years' history of enlargement of the outer segment of the right breast. This had been painless and consisted of two or three large bulging cysts. There was no abnormal hardness in any part, the skin was freely movable over the tumour, and the breast over deeper parts. The axillary glands appeared normal. After removal some solid material was subjected to microscopical examination, and it was spheroidal-celled growth.

This case strengthens the plea for microscopical examination in all growths which have been removed from the breast. A nodular surface with a history of moderate rate of growth will suggest colloid or mucoid degeneration. One patient, aged 72, with colloid carcinoma of right breast and glands, had undergone removal of the left half of the tongue nine years previously for epithelioma. She could talk well, and there were no signs of recurrence.

True suppuration may occur accompanied by the usual signs of inflammation, and an abscess may require incision. That it is not a simple pyogenic abscess is shown by the history and the excessive hardness of the surrounding parts. Two instances only have come under my notice.

Third Stage of Tumour.

The third stage, that of ulceration, supervenes sooner or later after the skin is involved. The extent of it will vary immensely and there may be more than one ulcer, usually without much fungation. Handley states that on an average ulceration commences two and a half years from the time when the disease was noticed. Three varieties are met with :—

(1) In which several superficial ulcers form on a breast extensively invaded by scirrhous growth. The gland is very hard, the skin thin where it remains, and fixed. This variety (Fig. 5) resembles the appearance produced by extensive tuberculous disease. Compare with Fig. 11.

(2) In Fig. 7 the ulcer has hard raised edges, is clearly defined, the surface is granulated, discharge slight, base fixed ; there was no pain.

(3) A more common type of ulceration is shown in Figs. 6 and 10. It differs from the others inasmuch as the surface is occupied by a mass of cell growth which outstands boldly from the tumour. The tissues around are hard and the skin infiltrated ; the skin is mostly carried forward irregularly at the circumference of the protrusion, portions having so far resisted complete destruction. This type of ulcer is liable to irregular sloughing, and may become very offensive.

Another distressing condition observed was that of a woman with advanced carcinoma of long duration. The surface of the enlarged breast was covered with papillomatous growths, which partly concealed irregular ulcerations, from which a continuous flow of thin acrid fluid of very offensive odour came. No antiseptic could quite overcome this, and a most disagreeable smell pervaded the whole house. She had much pain and was very cachectic.

It is mostly in this stage that proofs of extension of the disease are manifested by increase of the pain, fixation of the breast to the chest wall, enlargement of the supraclavicular glands, and solid œdema of the arm. Œdema of the surrounding skin gradually extends as an intractable thickening and the appearance known as " peau d'orange " is seen (Fig. 4). Sometimes small nodules form in the skin near, and multiply. There may be a general infiltration, slowly extending and stiffening the skin, until the patient is hide-bound, or fixed " en cuirasse." This may occur without signs of cachexia, but is usually associated with it.

DURATION OF LIFE.

The question is not infrequently asked as to the duration of life in carcinoma of the breast, and it is unwise to prophesy. The average is given in some of our text-books as three years, but it is wrong to be too dogmatic in any case. There are few surgeons who cannot point to some instance in which prediction of a rapidly fatal result has been falsified by the subsequent history of the case.

Some years ago an unmarried patient of 84 was seen in consultation who had been suffering for more than 20 years. She showed a large characteristic ulcer measuring about 4 inches across, which replaced the left breast. It was adherent, shallow, with irregular outline, sloughy surface, and somewhat offensive odour. There was also considerable induration in the neighbouring parts from irregular growth. The glands were slightly enlarged and hard. She was of spare figure, but energetic, and had recently been in the city by omnibus without an attendant. There was comparatively little pain throughout the illness, which terminated as a result of bronchitis about a year later.

Handley [3] mentions a case of 40 years' duration.

Discharge from the nipple is not very common in spheroidal-celled carcinoma, but is occasionally seen. The importance of this symptom is difficult to estimate in the absence of any evident change in the breast. It is mostly described as a scanty thin discharge of yellowish colour. A discharge from the nipple may not be caused by a malignant growth, and it may be years before any change in the breast gives a clue to its origin.

A multipara, aged 54, had noticed a discharge from the right nipple for several years. A small swelling had been noticed in the breast for 12 months—which had not increased much in size. This proved to be a chronic proliferative mastitis with cysts.

In a multipara, aged 35, a chronic discharge was associated with the later formation of a swelling above the nipple. This was a simple cystic dilatation of a large duct, without growth in its interior or in its walls.

If pressure over a certain point of the areola increases the flow, and still more if the fluid becomes blood-stained, there is a strong probability that a papilloma is growing in one of the larger ducts, although no tumour is felt. It may be that the growth is a duct or villous cancer. These growths have been regarded by some as less malignant than the other forms of cancer of this region. Perhaps the appearance of the discharge makes the patient seek for advice earlier, and be more ready to accept it. When there is only the occasional escape of a few drops of blood from a nipple, and pressure does not increase the amount, especially at the menopause, it will be advisable to try ordinary remedies and watch the case.

PAGET'S DISEASE.

The nature of Paget's disease, or eczema of the nipple, has been the subject of numerous investigations; some, especially two recently published, are most convincing (Handley,[4] Cheatle[5]). From the careful and thorough examination of specimens removed by operation these investigators have come to definite conclusions: (1) that the disease is carcinoma ; (2) that it is primary in the breast epithelioma.

The appearance of the milder form of eruption is shown in Fig. 9. No change of a carcinomatous nature could be found in most careful examination after removal. In the second of longer standing there was a well advanced carcinomatous ulcer, which had developed to the outer side of the patch, from the underlying breast tissue (Fig. 10). In these instances the skin disease somewhat resembled psoriasis. The more vivid colouring of the definite eczematous type almost suggests malignancy when first seen. Paget wrote that in every case he had been able to watch malignant disease followed within two years. Acting on his advice I have always advised complete removal without delay. Most surgeons can recall cases which have come to their notice in which disastrous results have followed postponement of operation and the trial of local remedies.

It is a very unusual experience to find more than one spheroidal-celled tumour in the same breast. Fig. 8 illustrates its occasional occurrence. The specimen is in the Museum of the Royal College of Surgeons of England. The almost simultaneous appearance of carcinoma on both sides is not unknown, as also the formation of a tumour in the remaining breast after amputation of its fellow.

In acute mammary carcinoma (medullary inflamed cancer, Fig. 14) when the epithelial elements form the greater part of the tumour and the stroma is scanty and vascular we have a great contrast to the other forms. Growth is so rapid that the condition is frequently regarded as acute inflammation of the breast. This is especially so when it begins during the period of pregnancy or lactation. The breast becomes enlarged generally, unduly projecting, and fixed. The skin over it is dullish red in colour, hot,

œdematous, and adherent. "Peau d'orange" is an early change. The temperature rises, and not infrequently the disease is diagnosed as a puerperal mastitis and incisions are made under the impression that there is suppuration present. Dissemination, both local and general, is rapid, whilst operation is usually of little avail to arrest the disease. Mr. P. H. Mitchiner recently met with an example in a girl of 16 who was nursing her first child.

Carcinoma of the male breast is rare, probably not met with on an average in more than 1 in 200 (St. Thomas's Hospital, all cases, 8 in 1642).[6] The local signs are the same as in the female, but it is less difficult to diagnose as it is comparatively superficial. Other growths resembling it occur but are also uncommon.

A man of 44 was sent with a hard nodulated plaque under the right nipple. This was painless and could not be separated from the nipple. There was no glandular enlargement and but a week's history. The breast was removed. Microscopical examination, "fibrosis around the ducts and acini of the gland, like that in the female breast in early fibrosis."

Endothelioma in a multipara, aged 27, was described by Mr. H. B. Robinson.[7] He found two hard nodular masses in the breast with slight dimpling of the skin over one part. Three hard glands were felt in the axilla. The clinical appearances were those of spheroidal-celled growth, but the cut surface did not cup on section. It had a pink colour and well-defined margin.

Malignant disease of the nipple is usually secondary to a scirrhus which is centrally situated in a breast. Primary disease may be epitheliomatous, spheroidal-celled, or columnar-celled carcinoma. The rarity of the primary growth is shown by the statistical reports of St. Thomas's Hospital, 1880–1915, inclusive (primary carcinoma of breast 1642 in number), during which period only three instances were registered. One of them was a spheroidal-celled growth, patient aged 69, another that of a girl of 11 years of age This case was published in THE LANCET.[8] Examination after local resection showed a papilloma to be epitheliomatous, and the axillary glands were taken away at a second operation; they were normal. There is a photograph in my possession of another case, which was brought by Dr. W. Ecklin.

A married woman, aged 52, had noticed that the nipple had been "going in a bit" for about a fortnight. It was one-third smaller than the right, hard, on a rounded hard base which had a raised edge. One hard gland could be felt in the axilla. Mr. S. G. Shattock reported "a duct columnar-celled carcinoma."

The specimen is in the Museum of the Royal College of Surgeons of England.

Attention should be drawn to the advisability of making a general examination of the patient. Although the local disease may appear operable, you must ascertain the absence of secondary growths in the chest, liver, and skeleton. These may have given no symptoms to which the patient draws attention, but the frequency with which secondary carcinoma invades the spine should lead to a careful examination of that part where there is complaint of weakness in walking, pains in the back, or girdle pains. A growth in the femur is often first revealed by fracture of the part, whilst in the humerus the formation of a swelling with but little pain may occur and you may unexpectedly find abnormal mobility at that point. The urine should be examined, as in all operation cases albuminuria may be a serious complication It is possible that those suffering from diabetes may be so improved by the administration of insulin as to permit of operation. But bad results have followed interference when this complication has been met with in the past, even when treatment has temporarily got rid of all traces of sugar from the urine. When the diabetic condition was unsuspected coma has supervened in a day or two, and when apparent recovery under treatment has been obtained, sloughing of the cellular tissue with a return of sugar in the urine ended in death from exhaustion.

DIFFERENTIAL DIAGNOSIS.

The swellings which it may be difficult to distinguish from early carcinoma of the breast are cysts, fibro-adenomata, and chronic inflammation. When the cysts and fibro-adenomata are associated with a local inflammation the diagnosis becomes at times quite impossible. A patch of chronic inflammation may be difficult to define, is often tender, and there may be more than one. The axillary glands are not hard, and if enlarged are not markedly so. There are no changes in the overlying skin, and no adhesion to pectoral fascia. Sometimes there is pain of a neuralgic character. A single cyst in such an area may have an extremely thick wall which, with the surrounding inflammation, conceals the presence of fluid. The tension in such a cyst may be so great that when a puncture is made into it, the fluid scatters for yards around. Peripheral mastitis is frequently seen on the axillary border, affecting both breasts in similar manner. Much pain is caused by it. There is an irregular collection of small swellings which are tender to pressure. A chronic abscess or a galactocele may, for a moment, cause hesitation in giving a decided opinion.

A fibro-adenoma may also occupy a position which, surrounded by inflammation, renders diagnosis impossible. Much will depend on the absence of local

Descriptions of Illustrations on Special Plates.

FIG. 1.—Spheroidal-celled carcinoma, right breast and glands, 16 months' duration. Patient aged 37.

FIG. 2.—Spheroidal-celled carcinoma; skin involved, with "corset groove." Patient aged 50.

FIG. 3.—Spheroidal-celled carcinoma, atrophic. Patient aged 52. Small lump noticed in right breast 11 years, dimpling of skin seven years. States "more dimpling now, but lump smaller."

FIG. 4.—Spheroidal-celled carcinoma, ? 12 months' duration. Retraction of nipple, contraction of skin, peau d'orange. Patient aged 56.

FIG. 5.—Extensive spheroidal-celled carcinoma, with pigmentation around ulcers, ? 12 months' duration. Patient aged 35.

FIG. 6.—Spheroidal-celled carcinoma, atrophic, duration four years. Nipple destroyed by ulceration. Patient aged 70.

FIG. 7.—Spheroidal-celled carcinoma, with ulceration. Patient aged 36. Duration, tumour ? 8 months, ulceration three months.

FIG. 8.—Spheroidal-celled carcinoma, two growths. Patient aged 50. Duration, nine months' outer growth, seven and a half months' inner. Nipple drawn in and towards inner growth; ulceration of outer growth; skin over inner growth infiltrated; glands diseased.

FIG. 9.—Paget's disease, eczema of nipple, six months' duration; nipple partly destroyed. Patient aged 47. Sore nipple, December, 1906, whilst suckling; abscess opened March, 1907, followed by eczema. Clinical laboratory report: chronic inflammation, no carcinoma.

FIG. 10.—Spheroidal-celled carcinoma, with ulceration, and Paget's disease of nipple. Patient aged 65. Duration, eczema seven years, tumour six years, ulceration one year.

FIG. 11.—Tubercle of breast. Patient aged 26. Six years' history of abscess, no history of tubercle. Breast much scarred, nipple retracted, glands enlarged.

FIG. 12.—Round-celled sarcoma of breast, not infiltrating, duration two months. Patient aged 13. Side view, showing clean outline of tumour pushing the skin forward.

FIG. 13.—Melanotic fungating sarcoma of breast, appearing soon after a blow on the breast. Duration 14 months, patient aged 36. Growth almost painless, pedunculated, and easily removed.

FIG. 14.—Acute medullary carcinoma. Duration three months, with pain. Patient aged 38. Large, œdematous, firm breast outstanding from chest wall; nipple and areola less prominent; skin shining with red streaks in it. Axillary glands diseased. General health good.

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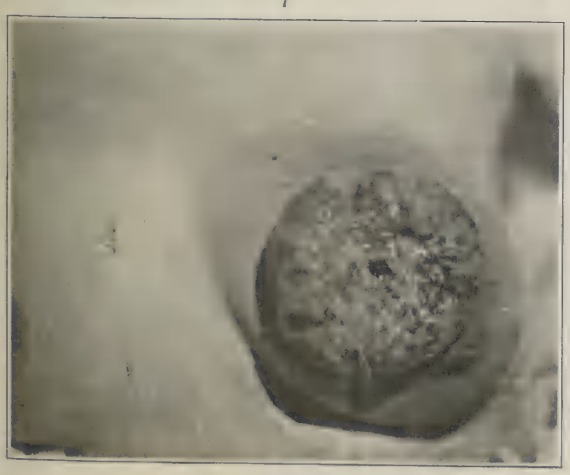

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MR. W. H. BATTLE: CLINICAL DIAGNOSIS OF CARCINOMA OF BREAST.

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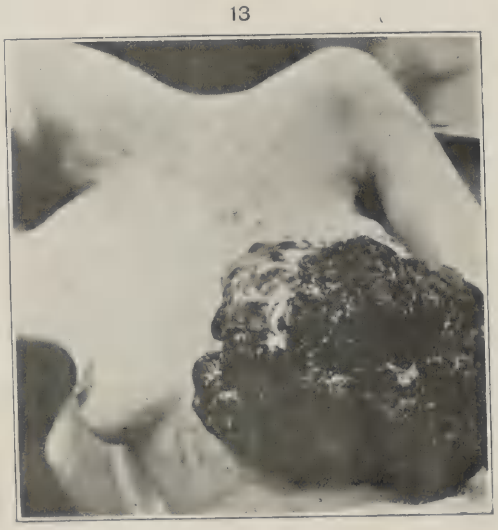

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signs of carcinoma, which should be present judging by the duration of the disease and the size of the swelling.

Sometimes a simple cyst bursts through overstretched skin and a fungating sore develops. The riot of growth is much more evident than in carcinoma, and microscopical examination will clear up the case. If the tumour is a large one of slow growth the probability of carcinoma is remote. Simple growths do not produce the deformity and surrounding changes that are met with in scirrhus.

It is advisable to explore small swellings (especially after the age of 30) about which there is doubt, an incision into or through it, should show even in small malignant ones, a cartilaginous resistance to the knife, a hard edge, a cupping of the surface, on which there is the appearance of the unripe pear. No one can mistake this section for anything else if he has had any experience, but doubtful tumours not giving all these characteristic signs should be submitted to microscopical examination at once. I have for some years sent sections of all breast tumours to a skilled pathologist for independent report—no matter how innocent they might appear. The fundamental sign (Quervain) is "the movability of the tumour in relation to the rest of the breast tissue," the duration of the growth is also important.

A mistake between tuberculous deposit and carcinoma is not usual in the first stage; the local enlargement is insidious, and little may be noticed to excite alarm until suppuration ensues. A primary focus may be found elsewhere. Deaver states that patients who are suffering from tubercle present themselves on an average 12 months after it has begun, and carcinomatous cases apply 30 months after its known commencement. In both there may be glandular enlargement. When there is a more extensive infiltration of the breast with suppuration the destruction may be considerable, but even here the undermining of tissues where sinuses have formed, with thinning of skin and pigmentation, can hardly be mistaken for carcinoma, although there may be a superficial resemblance to one form of carcinomatous ulceration. Compare Fig. 11 and Fig. 5. In tubercle there may be destruction of the nipple when the mischief has commenced near it. As already mentioned, any deposit of tubercle which has undergone calcareous change is very apt to be mistaken for carcinoma. The attention of the profession was first drawn to the occurrence of tubercle in the breast by Sir Astley Cooper,[9] but was practically ignored by writers on this subject until Mr. S. G. Shattock[10] drew attention to it in 1889. During the past 20 years many have recorded investigations on this subject.

In actinomycosis the disease is only recognised by the discovery of granules in discharge from an abscess.

Syphilitic disease of the breast is rare. Primary chancre may resemble a primary malignant growth of the nipple.

In one instance, that of a grandmother, aged 46, who was seen because of a very hard-edged ulcer extending to the left nipple with glandular enlargement, it was discovered at a later period when a secondary rash had developed, that she had been trying to keep a grandchild quiet by putting him to the breast. He had snuffles and other symptoms of congenital syphilis. The nipple had been sore for more than a month. The youngest child was aged 10 years.

This case emphasised the importance of a complete exposure of the chest in spite of remonstrance on the patient's part. The development of gummata in the substance of the breast occurs in three ways:[11] (1) The breast becomes swollen, firm, and irregular masses can be felt and seen; (2) one or two lumps form, and the rest of the gland remains healthy; (3) a large gummatous mass forms. A diffuse syphilitic mastitis leading to fibrosis and enlargement is not unknown.

One example of tertiary disease manifested itself by the formation of a small lump in the mammary tail and many hard lumps in the axilla. The patient was a multipara, aged 57, who had noticed a bruised feeling for 14 days, and on examination had discovered the swelling in the breast margin and numerous lumps under the arm. The segment of breast involved was excised and axilla cleared of many glands. The larger ones on section resembled sarcoma, and were of pinkish yellow appearance. Some of them were quite large. Microscopically, they were gummatous undergoing fibroid changes, the smaller glands being partly replaced by adipose tissue. There was a history of thrombosis of a large vein which had cleared up after a course of iodide of potassium.

Sarcomata of the breast may present some resemblance to carcinomata: (1) in the early stages, (2) when the skin has given way and there is exposure of the growth, and (3) when the tumour has undergone unusual changes. A sarcoma grows rapidly and when first seen has attained a size which in carcinoma would be characterised by adhesion to the skin and extreme hardness with definite involvement of the axillary glands. The sarcoma is more elastic to the touch, well defined, and instead of infiltrating the skin pushes it before it. It is shown in Fig. 12, which is a contour photograph taken by means of the X rays to demonstrate this.[12]

A girl, aged 13, had a swelling the size of a tangerine orange, described as "adeno-sarcoma," noticed for two months, and following a blow. She was again in hospital two years later and a vascular-looking tumour was removed from the left breast. This was reported as "adenoma." Four years later the left breast was removed on account of the formation of two more growths in it. These showed a pink firm section but microscopic characters of adenoma. The glands were not enlarged.

Another illustration, Fig. 13, shows the manner in which a sarcoma fungates when the overlying skin has given way, and no longer exerts pressure on the soft rapidly-growing mass. It was a round-celled growth which followed a blow received 14 months before.[13] The breast was small and the woman, aged 36, was anæmic and very low as the result of repeated hæmorrhages.

Some sarcomata develop cartilaginous change, and so resemble hypertrophic carcinoma in their unusual hardness, but they are usually of more rapid growth, characteristic invasion of surrounding parts is absent, and the hardness is mostly distributed in an irregular manner. In osteo-chondro-sarcomata—in which true bone may be formed—the sensation produced is much like touching a metallic foreign body under the skin. An example of this excessively rare tumour was shown at a meeting of the Pathological Society in 1886.

The tumour was removed by Mr. Mackellar from a woman, 73 years of age. She had noticed a lump in the right breast six years before; it was then the size of a pea and did not grow for two years. It increased to "hazel-nut" size by the end of five years and to that of an orange later on without pain. The nipple was retracted. Skin adherent, red, and tense over the inner part, which was excessively hard. One small hard gland was felt in the axilla.

As a rule, the glands are not affected in sarcoma. Sometimes they are rapidly growing, lobulated, soft, and encapsulated masses.

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BUCHANAN HOSPITAL, ST. LEONARDS. — The foundation-stone of the new women's wing of this hospital was laid on Dec. 17th last. The building and equipment is estimated to cost £7000. The new wing is to be named after Dr. Clowes Pritchard. The hospital was originally opened in 1884 and an out-patients' department was added in 1899. Between 300 and 400 in-patients are admitted to the hospital yearly, the number of out-patients exceeding 600.

PNEUMONIA AND ITS COMPLICATIONS.

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Pneumonia is a disease which has changed more than any other since I was a student. Then most of the cases were lobar; since the 1890 epidemic of influenza, the broncho-pneumonic and mixed types have been much more common.

A typical lobar case begins suddenly with a rigor, or in children sometimes with convulsions, has a very high temperature for five to eight days, and ends with a crisis, the temperature falling to below normal in less than a day. The face is flushed, respirations are rapid, the pulse should not be quickened quite in proportion to the rise of temperature. For the first day or two there may be none of the physical signs of consolidation, but the affected side of the chest will move less than the other, and the note on percussion will be less resonant. The breath sounds will be weaker than normal, but, though there may not be a suggestion of tubular breathing, vocal resonance is often a little increased. It is in this stage that a right-sided pneumonia may be confused with appendicitis, a patch of diaphragmatic pleurisy which is out of reach of auscultation, giving rise to pain shooting down towards the right iliac fossa, and to rigidity of the abdominal wall; but, in pneumonia, respirations will be rapid, and the right chest will not be moving as well as the left; also, a rectal examination will not reveal any tenderness in the right iliac fossa.

Pneumonia starting in the apex of the lung is, for some unknown reason, more severe than the more usual basal cases. The patient is generally very delirious and there is a greater tendency to hyperpyrexia. In some cases of hyperpyrexia there is a rapid diminution of the physical signs of consolidation, liquid crepitations occurring, and one theory advanced is that there is an unusual absorption of toxic products from the alveoli into the blood, and that this is the cause of the hyperpyrexia. A low temperature in a case with extensive physical signs is of grave import, implying defective resistance. Sometimes in a severe case there is a fall of temperature suggesting a crisis, but the pulse increases in rapidity, and the patient becomes pale and blue, usually dying. The fall of temperature is due to the breakdown of the body's reaction to the bacterial toxins. Often for a day or two before this the pulse is intermittent, which is a bad sign in pneumonia. On examining the blood one should find a leucocytosis, which may be even as high as 50,000, so that blood counts are not very useful as a guide to empyema. A high leucocyte count means a favourable case as a rule, and a low count a bad case. After a crisis the count falls, and, if it then begins to rise again, it does indicate empyema.

Broncho-pneumonia.

Broncho-pneumonia usually starts more gradually than lobar pneumonia, the temperature is not so high, and remits more in the morning. In influenzal epidemics the high temperature of the beginning of an attack may fall for two or three days, and then on the third or fourth day broncho-pneumonia may start and the temperature rise again with increasing illness of the patient. As to physical signs, medium crepitations are heard at the base of the lung, and spread upwards rapidly. Patches of finer crepitations develop, followed by tubular breathing. Dullness is not so absolute as in the lobar form. The area of lung affected may go on increasing for several days. The disease may last ten days or a fortnight, or even longer. In children there is a form of tuberculous broncho-pneumonia which is not distinguishable by physical signs from the pneumococcal, except in that the spread is slower and there is no resolution. It is important in a suspected case to get some sputum for examination; this is always difficult in children.

In influenzal epidemics very severe types may occur. One which might be called the hæmorrhagic begins with high temperature—104° or 105° F. The tongue is quickly dry and brown, and about the third or fourth day there is a profuse hæmoptysis, half a pint of blood or more being coughed up at a time. This is often preceded by severe pleuritic pain. I think that these cases are invariably fatal. Post mortem the lungs resemble those of pneumonic plague, large black blood-clots being scattered through the much congested broncho-pneumonic lung. Another set of cases might be called œdematous; in them, also, the mortality is very great, the temperature is not at all high, but the pulse and respirations are rapid, and the patient is obviously very ill from the start. Crepitations spread all over both lungs from bases to apices, and are very numerous. After only a few days' illness, in most cases, the face becomes a pale bluish-grey and death takes place within 24 hours of this change.

Pleurisy and Empyema.

Pleurisy occurs with all types of pneumonia, and often there is effusion, but aspiration is not advisable before the temperature falls unless there are signs of displacement or embarrassment of the heart, the fluid usually being absorbed. It is, however, a useful precaution, toward the end of the first week, to draw off a syringe-full to see if pus is developing, especially in the case of children, since in them breath sounds can be heard through pus fairly distinctly.

The most ordinary complication is, of course, empyema. In most cases it is quite easy to diagnose; an increasing rise of evening temperature with morning remissions and dullness and silence at the base of the lung with displacement of the heart, pointing definitely to it, but in quite a number of cases matters are not so simple. Difficulties may occur from the situation of an empyema. It is not altogether uncommon between the lobes of the lungs. Sometimes it develops on the side opposite to the pneumonia, which adds to the difficulty of diagnosis. If untreated such an empyema may burst into a bronchus, and after weeks of coughing, sometimes of fœtid sputum, may clear up, or chronic bronchiectasis may result. Physical signs are very varied, depending on which direction the empyema takes towards the chest wall.

In one case that I have seen a man had recovered from a left-sided pneumonia, and had been actually back to work; he had a severe cough and a good deal of expectoration. The temperature was 100° at night, there was dullness in the second and third right spaces in front, and diminished resonance below; bronchial breathing at the apex, distant tubular breathing in the second and third spaces, weak breathing below with coarse crepitations. Over the right back breathing was bronchial and rather weak in the upper half, but there was no dullness. An X ray photograph showed a pear-shaped shadow in the second and third spaces, with some shading of the lower lobe.

Another case was admitted under my care in the 2nd Eastern General Hospital with what appeared to be a large empyema on the left side, there being dullness and silence from the spine of the scapula to the base. Major Buck operated in the usual situation, below and external to the angle of the scapula, but the amount of pus was unexpectedly small and there was no improvement in the general condition, the temperature remaining hectic. A few days later I found that the lower part of the back was slightly resonant, but that just below the level of the spine of the scapula there was an area of absolute dullness about three inches in depth. An aspirator inserted here withdrew much pus, which, however, reaccumulated, and Major Buck removed a portion of the fourth rib between the scapula and the vertebræ and opened a large empyema between the upper and lower lobes of the lung. The operation was one of some difficulty owing to the depth of muscle. In this case the original empyema was evidently inter-lobar, and some of the pus had leaked down over the lower lobe, where it was found at the first operation. The man made a good recovery.

Besides these, I have seen three other cases of inter-lobar empyema, which have been subsequently cured by operation. One of these, however, was not preceded by pneumonia, but by a fall on the chest some weeks before. Mr. Fletcher opened this through the upper axilla and a cure resulted. When much pus collects in an inter-lobar fissure, the lower lobe of the lung becomes compressed and dull, leading to the belief that there is an ordinary empyema. In the earlier stages there may be dullness in the second and third spaces in front, or a band of dullness at the level of the spine of the scapula, and sometimes high up in the axilla, and diminished resonance over the lower lobe. On auscultation over the upper lobe there is weakened bronchial breathing from pressure; over any dull band very weak breath sounds, and below, generally weak and rather bronchial breath sounds with some crepitations. Unfortunately, the physical signs differ in every case. The best place to insert a needle is in the upper axilla with the arm at right angles to the side; this is the seat of election for operation, there being no muscle in the way.

A very rare position for an empyema is between the mediastinum and the lung. An elderly man had a very severe influenzal pneumonia of the left lung, during which he was desperately ill. He had a good deal of pleurisy over the left lower lobe. After a fall the temperature rose again, and the lower lobe of the lung, which had appeared to be clearing, became dull and silent, but no pus was found by exploration. After some days he suddenly coughed up a quantity of pus and continued to do so, the temperature meanwhile remaining hectic, and the lung dull and silent. The patient was then seen by Sir William Osler, who found a strip of resonance about 3 inches broad, just to the left of the vertebral column over the angles of the sixth, seventh, and eighth ribs. He pointed out that, as the patient was spitting up pus, there was probably a pyo-pneumothorax, and he had a needle put into the lower part of the resonant area just external to the angle of the eighth rib. Pus was at once obtained. Later, a piece of rib, just beyond the angle, was resected, and a large empyema opened which extended forward to a depth of 8 inches, but was bounded externally by the lung which was completely adherent to the parietal pleura, and collapsed, dull, and silent.

Another rare position is between the base of the lung and the diaphragm; of this I have only seen one case. After a right-sided pneumonia, the temperature and condition of the patient pointed to empyema, but, though the lower half of the right chest was wanting in resonance, it was not as dull as in empyema, and redux crepitations could be heard practically to the base, but I found a dull and quite silent area about 3 inches broad over the lower ribs in the posterior axillary region. A needle inserted here withdrew pus, and Mr. Fletcher in operating found a largish empyema between the lung and the diaphragm, with the lung firmly adherent to the chest wall above it.

Abscess of the Lung.—Suppuration of Bronchial Glands.

Abscess of the lung is another complication. A soldier was admitted under me during the war with a very severe broncho-pneumonia mainly of the right side, tubular breathing being most marked between the middle of the scapula and its angle. On the thirteenth day he suddenly spat up about an ounce of blood, and the following day his sputum became most offensive. A small patch of cavernous breathing could be heard in the centre of the tubular area. A radiograph taken by Captain Morton showed a round abscess cavity surrounded by inflammatory thickening at the level of the sixth rib. He was treated by inhalations of creosote, carbolic, and iodine from a Burney Yeo inhaler for several hours every day, and made a good recovery. Results of lung abscess are not usually so satisfactory, as they are generally due to gangrene of a larger area than in this case, and the mortality is very high. Surgery so far has not been very successful in such cases.

Suppuration of bronchial glands is a very rare complication, of which I have only seen one case, the diagnosis being made by my father. A week after the subsidence of a very severe pneumonia in a boy, the temperature began to rise, and a paroxysmal cough came one, very like whooping-cough, but the spasms lasting very much longer, even two or three hours, and being only controllable by light inhalations of chloroform. Eating and turning on to the right side provoked attacks of coughing. Vomiting was frequent. This sort of cough strongly suggested enlargement of bronchial glands. After four days of this condition there was a slight rigor with a rise of temperature to 101·2° F. On auscultation tracheal breathing could be heard over the upper sternum, and distant tubular breathing in the right first space near the sternum. Next day the heart was displaced to the left, and there was dullness in the second space. The temperature was hectic for the next five days, then signs of fluid began to appear at the right base. This was found to be only serous on inserting a needle. On the tenth day after the rigor he suddenly spat up half an ounce of pus, and coughed up some more during the day. The temperature at once fell. The suppurating gland had evidently burst into a bronchus. The heart only slowly regained its normal position, and the tracheal breathing disappeared. The fluid at the right base became absorbed.

Other Complications.

Pericarditis also is a rare complication, in some cases pus forming in the pericardium. Ulcerative or infective endocarditis may be set up by pneumococcus after pneumonia. It may be subacute, the temperature only being above normal two or three times in a week, and there may even be no cardiac murmur or only a mitral systolic, but the pulse is always quickened, and the patient is pale, ill-looking, and breathless, and often complains of shivery feelings, though there are no rigors. After some months this may become acute and end with emboli in the brain. In other cases there may be continuous pyrexia, with frequent showers of small emboli in the lower legs and forearms, and occasional infarcts in the lungs and intermittent albuminuria. Dr. Helen Boyle and I had the satisfaction of effecting a cure in such a case over a year ago by numerous injections of antipneumococcic serum, continued in spite of severe anaphylaxis.

Jaundice of a non-obstructive type, bile persisting in the stools, sometimes occurs in severe cases. A croupous colitis, accompanied by diarrhœa, is described by Bristowe and Osler. Post mortem a thin, flaky exudate is found on the summits of the folds of mucous membrane. Peritonitis as a complication is very rare, though pneumonia following on a pneumococcal peritonitis is not uncommon. Otitis media, mastoid suppuration, inflammation of the antrum, and other sinuses may occur.

Meningitis is not often met with in adults, but is not altogether uncommon in young children. It is a general inflammation of the meninges of the whole cortex. The early diagnosis is not easy, but it should be looked for when there is much delirium, by bending the head forward to see if the chin will touch the sternum, and by testing for Kernig's sign. If there is any suspicion a lumbar puncture should be done. This complication is usually fatal, but I have cured two cases by frequent injections of anti-pneumococcic serum, daily lumbar puncture, and large doses of urotropin. In one of these cases the cerebro-spinal fluid resembled the pus from an empyema.

Treatment of Pneumonia.

In the treatment of pneumonia it is most important that the patient should be kept as quiet as possible, since auto-inoculation takes place on any movement.

Nurses should be told that washing must be limited to a minimum. Many years ago in a case of pneumonia I had the patient's temperature taken just before the morning's elaborate ablutions, and again half an hour after their completion, and there

was a rise of nearly a degree, with very distinct malaise. On the next morning the temperature was taken at the same times without any washing of the patient, and no rise was shown. Sponging without moving is comforting and good.

For the same reason examination by the doctor should be as little disturbing as possible; percussion should be very light. After the diagnosis has been made, it is unnecessary to listen to the backs unless there are signs of fluid. The chest should be examined as far back as the posterior axillary lines without moving the patient, and, as long as crepitations and breath sounds are heard there, no serious amount of fluid can have accumulated. In the old-fashioned lobar pneumonia, with constant temperature between 104° and 105°, a large ice-bag continuously applied over the site of the pneumonia undoubtedly does good. In other cases antiphlogistine is beneficial, or, if there is much pain from pleurisy, this may be preceded by a linseed and mustard poultice.

As to specific treatment, a vaccine, if of the right type of pneumococcus and the correct combination of germs, may be very useful, if given early in the disease; but it is not safe in the very poisoned cases with low temperatures, as the negative phase may be too much for the patient. After the second day vaccines are not likely to be useful, since pneumococci are then usually circulating in the blood, and, if live pneumococci going through the glands will not produce antitoxin, it is unlikely that dead ones will. In delayed resolution, when the physical signs are not clearing a week after the subsidence of the disease, autogenous vaccines are of great assistance, also after operation for empyema they hasten the cure.

Many years ago I was told of the merits of Pane's anti-pneumococcic serum by the senior physician of Frankfort Hospital. Up to 1917 it was the most valuable remedy, but in the influenza epidemic of the autumn and winter of 1918 it was apparently useless, as also were the English and American serums; but the Pasteur Institute in Paris had prepared a serum by inoculating horses with all the germs of the spring epidemic of 1918, and the results of its use were marvellously good. Twenty cubic centimetres, repeated in from 12 to 24 hours, is usually sufficient, but a third injection may be necessary. Dr. Pane has since then followed the lines of the Pasteur Institute, and his serum is now quite effective.

Medicinally aspirin, first recommended by Dr. Alfred Scott, is undoubtedly valuable, but the doses should not be too large. I once saw, in consultation, a girl, who, just after the crisis, with a normal temperature was suffering from intense dyspnœa. There were no signs of fluid in the chest, and the dyspnœa reminded one of the air-hunger of diabetes. I found that she had been given large doses of aspirin, and concluded that it was a case of acidosis. Bicarbonate of soda by the mouth and rectum stopped the dyspnœa in a few hours, and the child made a normal recovery.

Quinine, given with aspirin, is also helpful, and this especially in post-influenzal cases. I have had good results with the creasote and iodide mixture, but patients dislike it. Ipecac. and iodide may be useful in loosening expectoration. Oxygen should always be kept ready. As a sedative at night Dover's powder is one of the best. In cases of intense poisoning Warburg's tincture is very valuable given by mouth or rectum, as, besides being a bactericide, it is a strong stimulant. It must be given in an alcoholic solution, such as port wine, since water precipitates the resins and destroys its efficacy. Hyperpyrexia should be treated by ice sponging or packing, and by large doses of Warburg's tincture.

It is very important to watch the heart. In the early stages of lobar pneumonia, if there are signs of over-distension of the right side of the heart, such as duskiness of the face, and marked epigastric pulsation, six leeches over the site of the pneumonia will have a good effect. If the pulse-rate is above 100 digitalis should be given regularly, but not in very large doses, and if up to 120 hypodermic strophanthin. Camphor hypodermically is also very useful.

PNEUMOCOCCAL INFECTIONS: THE BACTERIOLOGICAL ASPECT.[1]

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I feel strongly that a consideration of the causal organism of pneumoccocal infection should be the first event in any survey of its effects in the body. I have no new facts to contribute to this discussion, but I want to put before you a view of the present position of the pneumococcal lesions in pathology in the light of recent work with which I am familiar, and, since it is not possible to cover more than a small portion of the field, to take up certain sides of the activities of the organism which especially interest me, and to introduce them as subjects for later discussion.

The pneumococcus is usually and classically described as a Gram-positive, lanceolate, encapsulated diplococcus. It further has the following properties. Growing upon serum agar, which is an excellent medium, it forms small discrete colonies notable for their translucence; often these have a ringed appearance which is characteristic of many, but not of all, strains. Upon blood agar it produces methæmoglobin and turns the agar green; some strains produce, in addition, hæmolysis. It is an active fermenter of sugars, especially raffinose and inulin, this latter character tending to differentiate it from most streptococci, and in bile or bile salts it undergoes solution. Further, it is pathogenic for mice, in which animals it occasions a fatal septicæmia. What I have so far described is the classical conception of the pneumococcus, but in one or another property it often fails to correspond to this; other nearly related organisms frequently show some of the features considered characteristic of the pneumococcus. Elsewhere I have endeavoured to show that classification in the streptococcus group, of which the pneumococcus is a member, cannot be arrived at by the consideration of any one single property—morphology, sugar tests, hæmolytic action, &c.—but that we can only give a name to any one member of this group by considering all its properties together—particularly the following, which serve best to differentiate it from the enterococcus and streptococcus groups, taking into consideration at the same time morphology and cultural characters.

	Heat Resistance, 15″ at 60° C.	Bile and solubility.	Inulin.	Mannite.
Streptococcus	−	−	−	−
Enterococcus	+	−	−	+
Pneumococcus	−	+	+	−

Where, in organisms that otherwise conform, these four characters are distributed in the way I have shown, then the differentiation of the organisms is as certain as it can be, and where three of them are in accord, even if the fourth is anomalous, it is *probable* that an organism must still be placed within the group to which a majority of these characters assign it. Having put forward a definition of the pneumococcus, I want to touch briefly upon the following points. Firstly, its serological types; secondly, the routes of infection by which it obtains access to the body; and, thirdly, the lesions which it produces.

Serological Types of Pneumococcus.

The idea of agglutinating pneumococci is no new one, but experiments upon these lines remained unconvincing until in 1913 Dochez and Gillespie, examining 62 pneumococci in the presence of two monovalent agglutinating sera which they had prepared, found that 61 per cent. were agglutinated by either the one or the other serum, and grouped the whole series in the following manner.

[1] The opening paper read at a meeting of the Manchester Pathological Society on Dec. 12th, 1923.

I give the original figures of these workers; later and larger results have somewhat modified their proportions.

	Per cent.	
Type 1	41	(Agglutinated by Type 1 serum.)
,, 2	20	(,, ,, ,, 2 ,,)
,, 3	17	(*Pneumococcus mucosus*: distinguishable culturally.)
,, 4	22	(The residue: not serologically a fixed type.)

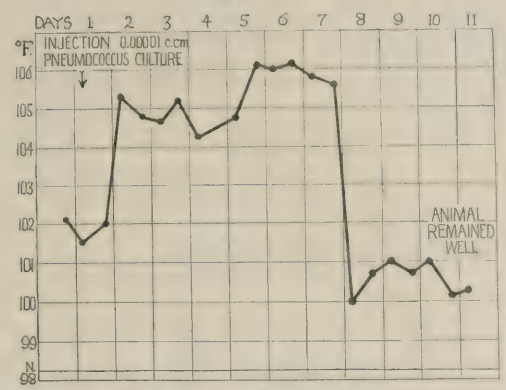
Such a serological grouping has been largely substantiated by animal experiments, the serum obtained by injecting an animal with group 1 coccus having considerable powers of protecting mice against infection with members of the first group. The same fact holds, but the efficiency of the serum is less marked, for group 2. Against group 3, which comprises organisms producing characteristic colonies and an especially dangerous type of pneumonia, an efficient serum could not be obtained, and in group 4, which is a residual class in which the majority of members are serologically independent, no single serum could be expected to prove efficacious against more than, at the very most, an extremely small number of strains.

The practical point which emerges from such a serological study is that the pneumococci fall naturally into a number of races which are serologically independent and specific, and, further, that antibodies, and consequently antisera, produced by means of members of one group are only potent therapeutically in infections by members of that group. Thus a specific serum which has a protective or curative value in group 1 infections is impotent against group 4 infections. The American work in this respect dominates the field, but although admitted in principle it is not universally agreed upon in detail. The French (Nicolle, Truche, &c.) deny the sharpness of the American divisions, insist on a much greater degree of overlapping than they allow, and hold that a similar overlapping exists in the protective power of sera when prepared from highly virulent strains, although admitting that these exert generally their maximum power against homologous organisms. The practical bearing of these investigations is upon the specific treatment of the disease, which will be dealt with fully by a later speaker.

Routes of Infection.

The lesions produced in the body by the pneumococcus are mainly those in the lungs, the meninges, and the abdomen. In the lungs the lesion is pneumonia; and in speaking of pneumonia I mean acute lobar pneumonia, a disease whose causal agent, in my limited experience, has invariably been the pneumococcus. I exclude from my contribution to this discussion broncho-pneumonia, which is a different disease and is not a specific infection. I do not propose to deal with the well-recognised pathological lesions of this condition, but only to allude to one or two of the more interesting problems which it presents. In the first place I wish to discuss the route of invasion of the lung. This has alternatively been described as by the air-passages and the blood-stream, and in reviewing the evidence we find many old facts and certain new ones. The old facts are these. In favour of blood infection we find the pneumococcus in the blood in a majority of cases of pneumonia, and I think that we can safely say that the organism is present in the blood-stream *at some time* in all cases of pneumonia. In the second place, certain cases have from time to time been cited in which pneumonia has definitely been a secondary event in the history of a pneumococcus septicæmia having origin in a lesion elsewhere. All that these facts go to prove is that the pneumococcus *can* spread into the lung when it invades the blood-stream. The real problem, however, is whether in the ordinary case the lung is invaded normally by the bronchial route, or whether the blood-stream is first invaded and the organism "electively" localised in a tissue which peculiarly favours its growth. The pneumococcus is normally an inhabitant of the mouth—an observation which goes back to Pasteur—but the type commonly found is generally the relatively avirulent Type 4; the more virulent Types 1 and 2 are rare in the normal mouth, although frequently present in cases of pneumonia. This puts the disease more than ever in the infectious category and opens up the question of whether pneumonia is not

FIG. 1.



Temperature chart of experimental pneumococcus pneumonia in a monkey (Cecil and Blake).

normally caught from another person rather than an autogenous infection, as has been widely held for many years. Given the presence in the mouth and upper air passage of an organism capable of causing pneumonia, we have to ask what is its subsequent path of advance, and by what means does it find its way into the pulmonary tissue? The matter has been considerably illuminated by some recent experimental work carried out by Cecil and Blake at the Rockefeller Institute, which has a very distinct bearing upon the problem. These observers studied at great length and in admirable form an experimentally produced pneumonia which they brought about by the intratracheal injection of quite small doses of virulent pneumococci. This was done by the introduction of a fine needle through the crico-thyroid membrane and

FIG. 2.

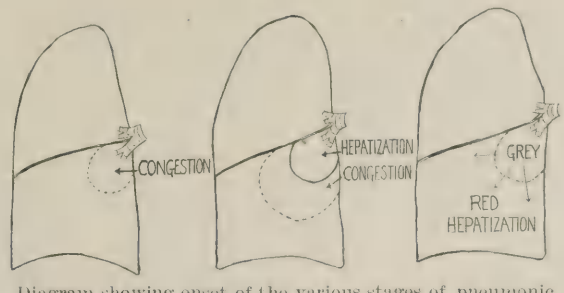


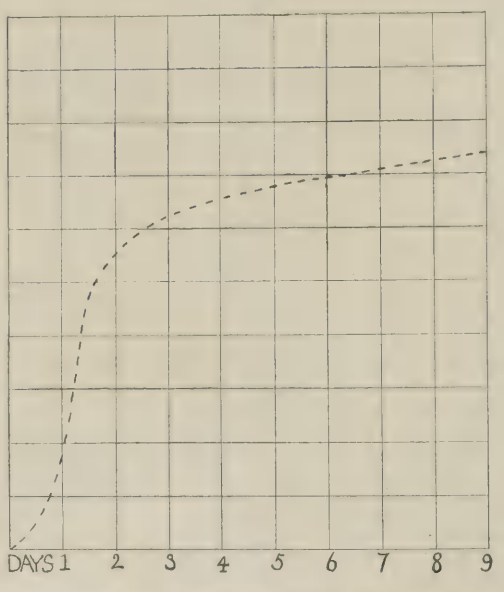
Diagram showing onset of the various stages of pneumonic consolidation and invasion of a lobe from the root zone.

the injection of the organisms in varying doses made up to a total bulk of 1·0 c.cm.—a trivial procedure in itself.

They found that with certain doses pneumonia could invariably be produced, and that this experimental disease was lobar in type and in every way comparable to the human disease, often beginning with a rigor, running a course of continued pyrexia for a number of days with a temperature chart absolutely comparable to that of the human case, associated with a polymorph leucocytosis, and either ending by crisis or causing death (Fig. 1). They also found that by putting normal monkeys into small confined cages with such artificially infected ones the disease might be caught by the former, and was associated with the presence of pneumococci of the same type as that used to infect the experimental animal. The appearances of the lungs in these animals was strikingly similar to those seen in human cases. The importance of this work lies in

the following points. It proves conclusively, if proof be still needed, that the pneumococcus will produce lobar pneumonia, and the fact that the disease could be produced at will and with certainty gave the experimenters opportunities for studying stages in the disease which are only very rarely available in human cases. With regard to the route of infection, this work confirms the aerogenic theory, since other animals injected intravenously or subcutaneously developed not pneumonia but septicæmia, which was not accompanied by lung lesions. There still remains a gap in our knowledge concerning the mechanism by which, in human cases, the organisms pass from the mouth to the

FIG. 3.



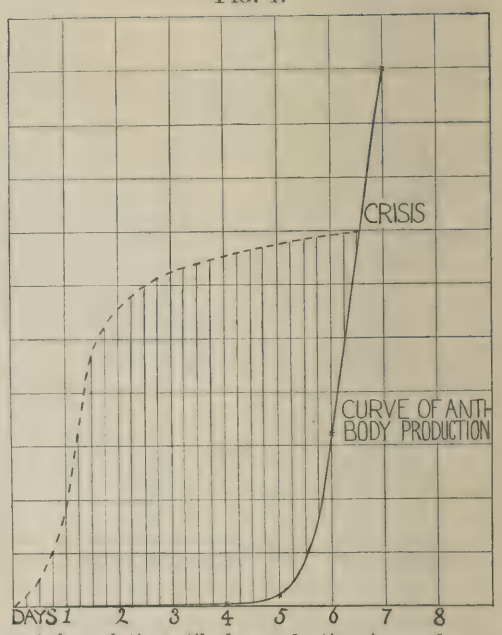
Theoretical curve of the rise and course of pneumococcal intoxication in pneumonia in a case not going to crisis by the end of the eighth day.

sublaryngeal region. Injection into the trachea caused practically invariably pneumonia, but spraying the mouth and pharynx by an emulsion of organisms was ineffective. In the work of Cecil and Blake it was also possible to study the course of invasion of the lung. The rapidity with which a whole lobe becomes consolidated has caused much speculation as to the mode of spread of the disease, and it has been asked if the infection involves in almost simultaneous fashion the whole of a lobe, or, alternatively, if to effect this rapid involvement lobar pneumonia may not have in its evolution a bronchial stage and be, in effect, a confluent broncho-pneumonia. The study of early lesions in apes shows that the disease spreads into the lung not along the air ways but eccentrically, from the root and main bronchus, and that in the early stages the organisms are not in the bronchioles and alveoli at all but are confined to the fibrous framework of the lung—perivascular and peribronchial areolar tissue, interlobular septa, and alveolar walls.

The Lesions Produced.

Thus, in its early stages the disease is *an interstitial inflammation* spreading outwards, fanwise, from the lung root. When, in common with all forms of inflammation, fluid and cells are poured out from the dilated vessels, these naturally accumulate in the alveoli, leading to red hepatisation, which follows the same line of spread from the hilum to the periphery (Fig. 2). It is only when the air sacs become filled with exudate that the pneumococcus grows out from the framework of the lung into the now consolidated air-spaces and appears in them. Grey hepatisation appears at about the fifth day; commencing in the portion of lung earliest affected, the root, it follows the same course of spread, and in experiments with apes it has sometimes been possible to find in an affected lobe a state of grey hepatisation at the hilum, of red hepatisation throughout the greater part of the lung, and of incomplete consolidation at the margins. We sometimes see the latter condition in consolidated lungs post mortem, but from a perusal of the findings I have been describing it seems that the disease spreads less rapidly through the lung in monkeys than it does in the human subject. The sharply lobar distribution is explicable, as it always has been for those who accepted the aerogenous theory, on anatomical considerations. The relatively avascular pleura opposes a pretty effective barrier to

FIG. 4.



Curve of hæmolytic antibody production imposed upon the theoretical curve of pneumonic intoxication The shaded area represents the degree and duration of the latter, and its rapid obliteration by the sudden formation of antibodies.

the direct and contiguous spread of inflammation, much as the dura often does under other circumstances. It is only after effective soldering of two lobes by plastic exudate, and inflammatory vascularisation of the opposing pleural layers, that one can conceive of a spread from lobe to lobe at a distance from the hilum. When this occurs, the infection may creep across the barrier and invade a contiguous portion of lung by continuity of tissue; here, of course, there is no outward spread from the hilum, such as I accept now as the ordinary mode of invasion of the primarily affected lobe.

Cause of Crisis.

One other interesting speculation upon which I should like to touch is the cause of the crisis. This has been variously attributed to a sudden development on antibodies; to an anaphylactic reaction (Truche); to a development of hydrogen-ion concentration in the diseased tissue incompatible with the life of the pneumococcus; and, by McLeod, to the production by the organisms of hydrogen peroxide, which ultimately reaches a concentration sufficient to destroy them. I cannot go over the arguments for or against these various views; my personal view inclines towards the antibody development theory. This, I am conscious, is a view at which gibes can readily be cast on account of the vagueness of our knowledge of antibodies, and I know it carries us perilously near to the conceptions of the older school of humoral pathologists. There are two outstanding facts which demand consideration; the first, which dominates the picture of crisis, is its time of occurrence, which is so regularly in the vicinity of the seventh day—the sixth to the eighth. The second fact is that the serum of

patients who have recovered from the disease can exert a definitely protective action towards mice, although no antibodies may be demonstrable by experiments in vitro. We are therefore, I think, entitled to assume the presence of some unrecognised antibody. Let us look at the condition of the patient. Pneumonia is a disease which develops rapidly, and once it is fully developed runs an approximately steady course over a number of days. I therefore suggest that the patient during this period is receiving a steady dosage of the poisons produced by the infecting organism, and that the cure of these, after a rapid rise, is maintained at a fairly steady level (Fig. 3); in the meantime the antibody production is slowly called into being by this fact. If we examine the course of development of easily observed antibodies in an experimental animal—e.g., the hæmolytic antibody—we find that after injection (or infection) the rise comes on gradually after a latent period, is slow in the beginning, and then gathers way with great rapidity. In a case where the response is good its curve is ascending in an almost vertical line somewhere about the sixth or seventh day. There is no reason to believe that the mechanism of production of antibody to the pneumonic organisms and its toxins should be a different one, and it therefore seems likely that the steady intoxication of a pneumonia is abruptly terminated by the steep and sometimes dramatic rise of antibodies which may be expected just at the time at which crisis takes place, and that where the curve of antibody rise cuts the curve of toxin concentration, there crisis occurs (Fig 4).

I have only touched upon the fringes of this fascinating subject, and even then upon only one of the types of infection which it includes. It has not been possible to deal with the infections of the peritoneum and meninges, both of which will, I hope, be dealt with in the course of the discussion.

THE TREATMENT OF ACUTE PNEUMOCOCCUS INFECTIONS OF THE RESPIRATORY TRACT.[1]

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I PROPOSE to limit my remarks within the very narrow compass of the acute respiratory infections due to the pneumococcus. And since this leaves a vast bulk of literature and work to be dealt with, I would further limit my observations to the treatment of acute respiratory infections by the pneumococcus.

Recognition of the Rôle of the Pneumococcus.

As long ago as 1874 it was pointed out by von Jurgensen that pneumonia was, in its course and character, an acute infection. Bacteria were first demonstrated in the sputum by Klebs, but Freidländer first described an organism which was regarded as the causative agent. This opinion was severely criticised by Baumgarten, and was quickly replaced when much more careful and generally accepted work was published almost simultaneously by Fraenkel and Weichselbaum. In 1880 and after Fraenkel's organism was found in other lesions than pneumonia. In the same year the pneumococcus was found in healthy saliva by Aufrecht, by Pasteur, and by Sternberg. These organisms were proved to be fatal to rabbits, but no pneumonic consolidation of lung was found in the animals. These findings, in conjunction with other facts, led to the belief that infection took place by direct inhalation of a normally existent organism of the upper respiratory tract, resistance being for some reason temporarily lowered. In 1884 Weichselbaum demonstrated the organism in the peripheral blood of patients with pneumonia, and prior to 1900 Silvestrini and Sertoli had recovered the pneumococcus from the blood-stream in 15 out of 16 cases, at the same time showing that this did not affect the prognosis.

[1] The second paper read at the meeting of the Manchester Pathological Society on Dec. 12th, 1923.

The recognition of the pneumococcus as the causative agent in pneumonia led directly to its recognition as the causative agent also in some of the complications of the disease—empyema, endocarditis, pericarditis, and arthritis. But in spite of this and of the concurrent development in the course of the disease, of nephritis, jaundice, and parotitis, the appreciation of pneumonia as a blood infection appears from the literature only slowly to have gained acceptance. It was taught that pneumonia was a focal disease with a general toxæmia, and it is still uncertain how widely acceptable is the view that pneumonia should be regarded as a blood infection with a focal involvement, precisely on all fours with typhoid. The point of view would appear to be important in the consideration of treatment.

Present Position of Treatment.

The early attempts to treat the disease along the lines of anti-sera were frustrated by the difficulties experienced by workers in their studies of the causative organism. Little if any reaction could be obtained by animal inoculation, except against the individual inoculum, and it was concluded that too many types of pneumococcus existed to make serum treatment a possibility. In 1913 Dochez and Gillespie published their study of pneumococcal classification by means of immune sera. By this means the organisms were divided into four groups, but not until the publications of the Rockefeller workers in 1917 did the classification bear any direct relation to the treatment of the disease.

The present position of this work is, I take it, somewhat as follows: The division of the pneumococcus into four groups is now generally accepted, except in France, where only three are recognised. Type 1 is accepted by all workers as a fixed type which produces a specific anti-serum, although this can only be accepted with certain reservations in view of Andrewes's recent work. Type 1 anti-pneumococcic serum is regarded by the Rockefeller workers as a specific against Type 1 pneumonia. This is accepted fairly generally in America, but with a good deal of reserve elsewhere. Glynn, in his 1923 report to the Medical Research Council, states that almost no evidence of the value of this treatment is available from English observers.

To determine, therefore, the desirability of trying this line of treatment in England, it would seem proper at the outset to consider some of the factors which must enter into a weighed judgment: (1) Incidence and mortality of pneumonia in England as compared with America; (2) incidence and mortality of Type 1 pneumonia in England as compared with America; (3) American statistics by workers other than those at the Rockefeller Institute of the success or otherwise attending this line of treatment; (4) experimental determination of the potency of the serum; (5) availability, dosage, and method of administration of the serum, with any dangers which may accompany its use; (6) any other line of treatment giving results as satisfactory and resting upon any sort of basis other than an empiric one.

At the outset it may be well to remember two fallacies which are extremely liable to affect such inquiries: First, the estimation of the value of a remedy is one of the most difficult of all problems. William Withering, in introducing digitalis to medicine in 1785, wrote: "It is much easier to write upon a disease than upon a remedy. The former is in the hands of nature, and a faithful observer, with an eye of tolerable judgment, cannot fail to delineate a likeness; the latter will ever be subject to the whims, the inaccuracies, and the blindness of mankind." Secondly, although we may agree with Sancho Panza that there is little to be gained by looking for this year's birds in last year's nests, yet it is equally true that we are very liable to believe the birds to be flown when in reality the eggs are addled.

Mortality.

The mortality for most acute infective diseases has gradually diminished under the improved hygiene of

the past few decades. The table shows these facts for England and Wales. In 1919 the total deaths from pneumonia, as given in the Registrar-General's report, was 38,984, yielding a death-rate of 105·8 per 100,000 (Table I.). In America the corresponding death-rate was 149·8 per 100,000. It would not appear that any further figures are required to demonstrate the very present importance of the question of the treatment of pneumonia. The title of Captain of the Men of Death, given to tuberculosis by John Bunyan, was transferred from that disease to pneumonia by William Osler. Cole states that in England, France, and America probably one-tenth of all deaths are due to acute respiratory diseases. Often enough this is merely a terminal event, but apart from these, many are wiped out at the maximum of their economic efficiency. Shattuck and Lawrence, analysing 2882 cases from the Massachusetts General Hospital, concluded that there was a 10 per cent. increase of case mortality for every decade after the age of 20.

Type Incidence.

Polyvalent and other sera have from time to time been introduced for the treatment of pneumonia, but it appears that they have failed to satisfy bacteriological tests with the exception of that prepared by Trouche. The Rockefeller workers only offer a serum against type 1 pneumococcus. It therefore becomes important to find the percentage incidence and mortality of type 1 pneumonia so far as figures are at present available.

TABLE I.—*Crude Mortality Rate per Million Living.*

Year.	Typhoid.	Phthisis.	Pneumonia, excluding influenza.
1861–70	—	2590	990
1871–80	321	2231	937
1881–90	199	1810	1034
1891–1900	175	1418	1214
1901–1910	91	1143	1254
			Death-rate from pneumonia per 100,000.
1919 England and Wales ..			105·8
1919 America			149·8

Tables II. and III. show the incidence and mortality of the various types of pneumonia in America and part of Europe. For the bulk of my figures I would acknowledge my indebtedness to the very interesting report to the Medical Research Council by Prof. E. E. Glynn, of Liverpool, and his co-workers, as also for the excellent bibliography. It is at once noticeable how largely the American figures bulk in all these records, but a great deal of similar work has been done by Lister and others among the Rand miners, of whom pneumonia has been and still is so great a scourge. From the tables shown it would appear that one-third of the English and American cases are due to type 1 pneumococcus, and taking the 1919 figures for England, Glynn estimated that in that year 32,000 people contracted type 1 pneumonia, and 8000 died from it. So that there would appear to be quite sufficient annual material to justify the use of the serum here as in America.

TABLE II.—*Lobar Pneumonia.*

—	Type 1.		Type 2.		Type 3.		Group 4.	
	Inc.	Mort.	Inc.	Mort.	Inc.	Mort.	Inc.	Mort.
America 1632 cases	32·5	21·2	26·0	34·7	11·6	54·1	29·4	19·1
France 61 cases	19·0	—	88·0	—	27·0	—	2·5	—
Gt. Britain 361 cases	38·0	27·1	32·0	36·3	3·9	25·0	27·1	11·5

Inc. = Incidence. Mort. = Mortality.

TABLE III.—*Broncho-pneumonia.*

—	Type 1.		Type 2.		Type 3.		Group 4.	
	Inc.	Mort.	Inc.	Mort.	Inc.	Mort.	Inc.	Mort.
America 797 cases	1·1	—	8·9	—	10·9	—	79·1	—
France 26 cases	64·0	—	57·0	—	64·0	—	0·0	—
Gt. Britain 85 cases	9·4	0·0	17·7	—	4·7	50·0	68·2	29·1

Efficiency of the Serum: Experimental.

As the guinea-pig is the final court of appeal in tuberculosis, so is the white mouse in pneumococcal infections. The reaction in the latter is to some extent both qualitative and quantitative, and the minimal lethal dose of a culture can be determined with moderate ease. If antipneumococcal serum can reasonably be expected to produce any curative effect, it should antagonise a high multiplication of the minimal lethal dose. The Rockefeller workers found that they could produce antisera to types 1, 2, and 3, but they failed to do so for group 4, except for individual members of that group. Further work led them to the conclusion that their antisera for types 2 and 3 were unsatisfactory, but they found that a serum could be produced, 0·2 c.cm. of which would protect a 20 g. white mouse against 10,000 M.L.D. of type 1 pneumococcus. Other observers appear to have obtained much the same results. In 1920 Cecil and Blake published a most interesting series of articles, in which they showed that constant results could be obtained by intratracheal injections of virulent pneumococci in monkeys, and that the disease so produced ran a course exactly comparable with pneumonia in the human subject.

Experiments were then made with type 1 pneumococcus, pneumonia being produced with an amount of inoculum well above the M.L.D. for the monkeys used. Antipneumococcic serum type 1 obtained from the New York State Board of Health was given on various days of the disease. Four examples are extracted on Table IV. to show the type of result obtained. These would appear to be as striking as any serological treatment could well be, but in reading their protocols one is constantly struck also by the certainty and rapidity with which the organisms disappear from the blood-stream. There is no record of any untoward results from the quantity of serum administered. The average weight of the animals was one-sixteenth the weight of the average human being, and it is supposed, therefore, that to obtain the same results clinically sixteen times the doses here shown would be required.

Efficiency of the Serum: Clinical.

In the estimation of the efficiency of any serum treatment many factors must be considered, and the numbers available for judgment are insufficient to come to any real conclusion. Table V. gives some indication of the results; more than half the cases are recorded by the Rockefeller workers, and all the sera, so far as I have been able to find, came from that source. We do not know whether the average age of the untreated cases would be identical with that of those treated, neither do we know the day of disease upon which the serum was given. Although the sex incidence of pneumonia is as 3 to 1 in favour of males, yet the mortality is considerably higher in females. All these and a host of other factors will occur to each one of us, making the smallness of the data a very considerable bar to their ready acceptance. More particularly is this the case when we remember that the mortality from pneumonia in the pre-war German Army showed much smaller figures than those now given by the Rockefeller workers.

Clinical findings have been published showing the rapid disappearance of the pneumococcus from the blood-stream as the result of suitable serum treatment; findings exactly comparable with those of Cecil and Blake, but the value of negative findings in blood-culture work would appear to be very problematical.

TABLE IV.—*Results Obtained after the Use of Antipneumococcic Serum Type 1.*

Day of disease.	Monkey 93. Dose 0·001 c.cm.				Monkey 94. Dose 0·1 c.cm.				Monkey 15. Dose 0·001 c.cm.				Monkey 113. Dose 0·01 c.cm.			
	Tr.	Pn.	WBC.	Serum.	Tr.	Pn.	WBC.	Serum.	Tr.	Pn.	WBC.	Serum.	Tr.	Pn.	WBC.	Serum.
1	101	1	16	—	100·6	43	24	—	101·2	3	15	—	106	1	32	—
2	103·5	337	36	—	104	103	74	25	Rigor. 103·6	37	65	40	105	88	35	—
3	103·5	500	16	—	103	—	15	20	102·6	—	28	10	105	100	24	—
4	104·4	365	14	—	101	—	13	—	102	—	16	—	104·6	69	14	—
5	104	216	11	—	103	—	19	20	101	—	17	—	104·5	17	15	30
6	104·5	24	10	—	Crisis.		21	—		Recovered.			104·5	—	12	30
7	104·6	35	12	—	Recovered.								103	—	22	30
8	103	73	11	—									103	—	23	20
9	101	66	12	—									Recovered.			
10	104	12	11	—												
11	103	3	16	—												
12	102	16	18	—												
13	—	750	Died.													

Key.—Dose = Quantity of virulent broth culture injected intra-tracheally. Tr. = Temperature Fahr. Pn. = Pneumococci per 0·5 c.cm. blood. WBC. Leucocytes expressed in thousands. (Abstracted from Blake and Cecil.)

TABLE V.—*Serum Treatment.*

	Cases.	Deaths.
Neufeld and Handel	3	0
Bloomfield	11	3
Cole and MacCallum	12	0
Park and Chickering	31	2
Hart	31	7
Cole	195	18
French	15	6
Glynn	6	2
	304	38

Later—

Cole reports	195 cases	Death-rate.	10·5 per cent.
Thomas	255 ,,	,,	12·9 ,,
Total	859 ,,	Mortality	12·0 ,,
In absence of serum treatment mortality probably not less than			25·0 ,,

TABLE VI.—*145 Serum-treated Cases.*

Serum given within—	Cases.	Deaths.	Mortality.
			Per cent.
First 3 days	12	0	0·0
,, 4 ,,	38	7	18·4
,, 5 ,,	68	8	11·8
,, 6 ,,	89	10	11·2
After 6 ,,	56	15	26·8

TABLE VII.—*71 Controls Untreated by Serum.*

Admitted within first 3 days	13	4	30·8
,, ,, 4 ,,	32	4	12·5
,, ,, 5 ,,	46	4	8·1
,, ,, 6 ,,	58	7	12·1
Admitted after 6 days	13	5	38·1

Tables VI. and VII., copied from Locke's critical review of this work appears to carry with it some conviction in spite of the very small numbers, especially as it was produced under controlled conditions; for every case treated by serum one was also treated without serum.

Availability.—In looking through the present literature it appears that almost all the published results of serum treatment have been attained from that issued by the Rockefeller Institute. Type I anti-pneumococcic serum is now, however, a British product, can be readily purchased, and is standardised to the Rockefeller standard, but I know of no clinical records of its use. At the same time there would seem to be no reason why it should be any different from the older serum.

Dosage.—Speaking broadly, it may be said (1) that the serum should be given intravenously and slowly by a gravity method; (2) that the first dose should be 100 c.cm.; (3) that this dose should be repeated every eight hours until a favourable result is attained; (4) the average dose required is 250 c.cm., but in severe cases four times that amount may be necessary. Cecil and Blake undertook their work largely because they considered that physicians were unduly sceptical of the value of the serum and that when used, frequently it was given too late in the disease and in too small doses. It is probably as unfair to judge of serum treatment when given late in the disease as it would be to judge similarly of antidiphtheritic serum.

Dangers.

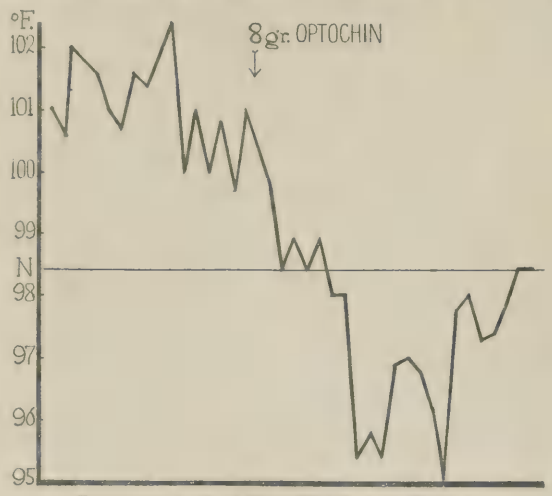
In looking through the recorded cases there appears to be a very real danger of serum reactions of two varieties: (1) An immediate reaction in the nature of anaphylactic shock, which can to some extent be countered by ten minims of one in a thousand adrenalin solution, or avoided by slow and gradual desensitisation; (2) a later reaction occurring around the eighth day and showing urticaria, arthritis, and pyrexia. It appears that in some cases this temperature reaction may last a long time, and may be difficult to differentiate from a continuance or a complication of the original infection. In this connexion it should be remembered that there is reason to expect serum sickness in the very type of patient for whom this treatment would seem most urgently needed. The man in the prime of life to-day has almost certainly been in the army, and is therefore quite likely to have had one or more injections of prophylactic antitetanic serum during his war service. The proportion of such in the adult male population to-day must be considerable, and they therefore constitute a very real danger. So that, prior to administration, it would seem wise to inquire carefully as to previous dosage with any horse-derived serum and also to inquire for a history of asthma.

Other Treatments.

In 1911 Morgenroth and Levy introduced the drug ethylhydrocuprein, a derivative from the quinine group, under the name of optochin, and claimed for it a sterilising power against the pneumococcus of a very high order. In 1912 Wright investigated these claims, and concluded that they were well founded. A series of clinical studies were made by Moore and published in 1920. A good deal of work has been done on this quinine derivative which goes to show the following points: (1) That its activity is much greater against the pneumococcus than against any other organism (so far is this the case that Moore suggests its use as a test for the pathogenic pneumococci); (2) that it will inhibit the growth of the pneumococcus in vitro in dilutions as high as one in a million; (3) that in experimental mice or rabbits it is capable of protecting against a hundred minimal lethal doses of virulent pneumococci; (4) that its action is best seen when given under conditions of slow absorption, and is too evanescent to produce good effects when given intravenously; (5) that when given in conjunction with a homologous antiserum it is capable of multiplying the effect of that serum by 50; (6) that it acts equally efficiently against all types of pneumococci, including *Pneumococcus mucosus* 3; (7) at the same time it possesses a very definite toxicity, and it is possible to kill the animal in attempting to cure the disease.

Moore and Chesney published in 1923 a report on the use of this drug in pneumonia. They state

that in 75 cases no definite therapeutic effect could be shown, but that 12 per cent. of their cases showed amblyopia, three mild in degree and six severe. All those who survived the pneumonia recovered their sight. They attribute failure to the toxicity of the drug, which shows toxic effects before a pneumococcidal concentration has arisen in the blood. It is stated that no ocular signs have been seen so long as the dose given does not exceed 24 gr. The temperature chart here given shows the result of one dose of



Four-hourly chart from fifth day of disease.

8 gr. given to a recent case which was not doing well; whether the marked subnormal temperature was post, cum, or propter is very doubtful, but the crisis was certainly accompanied by much more shock than usual. No data have been found for treatment with serum and optochin.

Returning again to the treatment of pneumococcal infections by homologous antisera, the question of determining the type of organism concerned must be considered from the point of view of the ease or difficulty with which this may be done. Antisera may now be freely purchased for this grouping; they can, however, scarcely be called "high-titre sera," for their titre is very low, and this materially diminishes their use, and one can only hope in the future that much higher titres may in some way be obtained.

There are two methods of grouping which may almost fairly be called clinical, in that they may be applied at the bedside in a short space of time.

(1) The urine is said to contain a body which by interaction with the specific serum yields a precipitate only for the group to which the infection belongs. The clear filtered or centrifuged urine is added to the undiluted high-titre serum, a precipitate indicating a positive result.

(2) Since bile solubility is one of the bacteriological tests for the pneumococcus, it follows that the organism may be extracted from sputum by that means. One per cent. taurocholate solution may be added to pneumonic sputum in equal volume, and the whole thoroughly shaken for some minutes. The mass is now filtered through ordinary filter-paper, and a precipitin reaction may be carried out in a piece of narrow-bore glass tubing with a teat on the end. In this way a rough grouping may be rapidly done against the undiluted type sera, although the lowness of the present British sera must delay the result. Glynn in his work found a similar procedure most useful and trustworthy, but he was using the Rockefeller sera.

To the ordinary bacteriological processes in connexion with the pneumococcus, Dr. Dible has already referred, but it is manifest that if the pathologist is to coöperate adequately with the clinician in this matter of grouping, the time occupied in investigation must be reduced to a minimum. It is in this respect that the white mouse method is so valuable, particularly if the peritoneal exudate be used for direct agglutination, as the time occupied would be measured in hours only.

Blood-culture has been found to give about 50 per cent. of positive results, and Rosenow considered that the fourth, fifth, and sixth days were the most likely; but lung puncture, used largely by French in France during the influenza pandemic, would appear to be quite safe, to involve the patient in but little suffering, and to give a very high percentage of positive results. This would appear for many reasons to be the method of choice, to which view Lister in South Africa also testifies. By either of these methods a pure culture is likely to be obtained, which is easy to agglutinate later.

I take it as an axiom nowadays that no remarks on the treatment of an acute infection can be regarded as complete without some consideration of the carrier problem. It is stated that 80 per cent. of all lobar pneumonias are due to one of the three fixed types of pneumococcus. On the other hand, 90 per cent. of pneumococci recovered from the bucco-respiratory tract of healthy individuals belong to group 4. Similar investigation of pneumonia contacts shows a very high percentage of pneumococci belonging to the type with which contact has occurred, as was shown by the examination of nurses, orderlies, residents, and physicians who were working amongst the disease. The carrier state of recovered pneumonia cases has been shown to persist for periods varying from 28 to 90 days, and it is well recognised that the virulence of the pneumococcus can be materially raised by animal passage.

Conclusions.

It has been my endeavour to lay before you some data upon which the following theses may perhaps be supported: (1) Pneumonia is an acute general infection; (2) its annual death-roll in our own country is sufficiently high to merit not only careful attention but furious thinking; (3) a greater statistical knowledge is more than desirable; (4) bacteriological investigation is not only the road to increased knowledge but also the key to treatment; (5) there is sufficient evidence to justify the statement that serum treatment should be instituted in suitably typed cases as early as possible in the disease, should be given in suitably large doses, should be repeated every eight hours, and should be persisted in; (6) optochin in non-toxic doses merits a further trial on the grounds of experimental data; (7) without the aid of one or both of these methods we are left with a merely expectant routine, creditable enough in the days of Hippocrates, but scarcely justified in the light of such masses of evidence as modern research has placed at our disposal.

DIABETIC COMA WITH ANURIA.

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A CASE of diabetes mellitus in coma, associated with complete anuria, provided the opportunity of observing the action of insulin upon the intermediary metabolism in diabetes under conditions where the excretory function of the kidney was in total abeyance, and therefore playing no part, in so far as that function is concerned, in the regulation of the chemical composition of the blood. (Experimentally, the condition might be simulated in a partially depancreatised animal by ligating the renal arteries and inducing coma by an appropriate diet.)

The observations made in this case, although by no means complete, are of considerable interest, for not only do they reveal what marked changes in the blood may be effected, independent of renal excretion when insulin is administered in diabetes, but also they show that the toxæmia associated with total suppression of urine does not inhibit the action of

insulin as do certain toxæmias, especially those of pyogenic origin.

Clinical History.

J. C., aged 60 years, a metal-smith, was admitted to the Sheffield Royal Hospital, under Prof. Arthur Hall, on May 30th, 1923, in a comatose condition, and the following history was obtained from his wife:—

The subject of diabetes for six years, he had been successfully treated by dieting during the last two, attending hospital as an out-patient. He was an intelligent man, and had been in the habit of testing his own urine from time to time, and on the appearance of sugar had abstained from all food until sugar-free. His diet during these two years had consisted of vegetables, eggs, bacon, and gluten bread. Ever since his illness began he had been troubled with constipation, but about Christmas, 1922, this became more pronounced, and he began definitely to fail, suffering from polyuria, which necessitated his rising frequently in the night, and great thirst. He also began to lose weight.

He was admitted to the wards at 1 P.M., and his condition was as follows: Dyspnœic but not hypernœic, pulse regular. Very thin and emaciated, lying with limbs still and rigid in a flexed position. They can be extended with difficulty. He is very drowsy, cannot answer questions, and seems unconscious of his surroundings, though he moves away from the prick of a pin. Eyes react normally to light, though both pupils are rather small. There is no paralysis of the ocular muscles, nor any retinal changes, his discs appearing quite normal. The tongue is dry and coated, and the breath smells strongly of acetone. There is nothing abnormal on abdominal examination. No paralysis of limbs and the superficial and deep reflexes appear to be normal. A few râles are audible at both lung bases and there is a faint systolic murmur heard over the præcordium.

It was clear that he was in a state of coma, and immediately he was ordered the usual routine treatment of soap enema, followed by saline enema, and hot water by mouth. At 6 P.M., as he had passed no urine, a rectal examination was made, which disclosed a moderately enlarged prostate, in consequence of which a catheter was passed but no urine was obtained. The blood pressure estimation gave the following figures: Systolic B.P., 105; diastolic B.P., 70. The blood examination showed: Blood-sugar, 0·957 per cent.; plasma bicarbonate, 15·7 vols. per cent.; ketone bodies, as acetone, 59·13 mg. per 100 c.cm., plasma; non-protein nitrogen, 110 mg. per 100 c.cm.

Treatment.—The treatment he received is summarised as follows:—May 30th: On admission, 1 P.M., enema, and hot water by mouth; at 6 P.M. and 9 P.M., insulin 20 units; at midnight, insulin, 20 units, glucose, 10 g., per rectum; May 31st: 4 A.M., insulin 20 units. By this time he was quite rational though still anuric. 10 A.M.: Pilocarpine 1/3 gr. produced profuse sweating; during the forenoon hiccough and vomiting began. 12 noon: Digitalis 1/100 gr., strychnine 1/60 gr.; 2 P.M., pituitrin 1 c.cm.; 4 P.M., insulin 20 units. In spite of hot packs, &c., he remained anuric and his condition steadily grew worse until death, which occurred on June 2nd, at 5 A.M.

Autopsy Report.

At the post-mortem examination many old adhesions were found on both pleuræ, with some basal œdema of both lungs. The kidneys were small and œdematous, and showed signs of chronic interstitial nephritis, the capsule being adherent. The bladder was small and contracted, and contained about a drachm of urine. The head of the pancreas appeared hard and fibrotic. There was generalised marked arterio-sclerosis throughout the body.

Microscopic Examination.—Liver: A slight early passive congestion is present and the liver cells contain a minute amount of bile pigment. No cirrhosis present and bile-ducts healthy. Kidney: Shows the typical "granular" appearance, with alternating markedly and slightly sclerosed areas. Hyaline casts are present in some of the tubules, but the tubules show no acute nephritic changes, though post mortem autolysis is present in moderate amount. Atheromatous changes, though present in some of the vessels, are by no means marked, whilst a trace of passive congestion is seen. Spleen: Shows some increase of the fibroblastic elements of the stroma. A few small recent hæmorrhages are seen in the section, as also small groups of cells containing pigment which appears to be hæmatoidin. The Malpighian corpuscles are normal. Pancreas: Sections from various areas of the pancreas have been examined. Some slight chronic fibrotic changes are seen about the ducts, whilst the alveolar portion of the gland is normal, save that the islets of Langerhans are practically unrepresented in the sections.

The blood-sugar was determined by the method of Folin and Wu.[1] At 5.30 P.M. on the day of admission it was 0·957 per cent. This is the highest value ever obtained in this hospital (higher values have been reported by Joslin.[2] who records a case with blood-sugar of 1·37 per cent. 12 hours before death). By midnight it had fallen to 0·56 per cent., and at 9 A.M. next day it reached 0·247 per cent. Thus in 15½ hours, during which time 80 units of insulin had been injected, the glucose was reduced to 25·8 per cent. of its former concentration. Assuming the blood volume in this patient to be 5 litres, and that it remained the same, there were about 35 g. less glucose in the circulating blood than before the exhibition of insulin. Of course, the actual amount of glucose utilised was considerably greater than this, for other body fluids would be in equilibrium with the blood as regards their glucose content. Since none was excreted by the kidneys, the glucose must have been oxidised, polymerised into glycogen, or converted into fat.

The Plasma Bicarbonate.—When the concentration of sugar in the blood was highest the plasma bicarbonate was 15·7 vols. per cent. This showed a very marked reduction (the normal average value being 60 vols. per cent.), and indicated a severe acidosis. The next day it had risen to 39 vols. per cent. The acetone bodies in the blood were determined by the method of Van Slyke and Fitz.[3] When the plasma bicarbonate was 15·7 vols. per cent. the total acetone bodies, expressed as acetone, were 59·13 mg. per 100 c.cm. of blood plasma. The next morning the value fell to 26·42 mg., and at 5 P.M. the same day reached a value of 6 mg. per 100 c.cm. of plasma. While the patient was in coma it was impossible to obtain a sample of alveolar air, but a sample obtained at 1 P.M. on the day following the beginning of insulin treatment had a carbon dioxide tension of 34·7 mm. Hg.

Remarks.

The changes thus observed are those which accompany the successful treatment of diabetic coma with insulin. The remarkable feature in this instance is that they occurred quite independently of renal excretion, for though the kidney was playing no part in the removal of glucose and acetone bodies from the blood, or in the regulation of the acid-base equilibrium by the excretion of an acid urine, an adjustment toward the normal was nevertheless brought about to such a degree that the patient emerged from the coma. It would seem that this must have been due to the oxidation processes in the tissues. With the utilisation of glucose there would be oxidation of the ketone bodies, with a liberation of bases and a corresponding diminution in the acidosis.

Such an assumption receives support by the following considerations. The ketone bodies in the blood, expressed as acetone, were 59·13 mg. per 100 c.cm. just before the insulin treatment was begun. By the next afternoon they had decreased to 6 mg. per 100 c.cm. Therefore, from every 100 c.cm. of blood 53 mg. of ketone expressed as acetone had been removed. Assuming that the ketone bodies were present in the form of β-hydroxybutyric acid, then from each 100 c.cm. of blood 96·89 mg. of this acid which would require 21·42 mg. of the base sodium to neutralise it were removed. With the oxidation of this acid the base would be liberated and accordingly increase the plasma bicarbonate, for the carbon dioxide tension of the blood is such that all the base available after the more highly dissociated acids are neutralised is converted into the bicarbonate. 21·42 mg. of sodium are capable of combining with 41 mg. or 25·7 c.cm. of carbon dioxide as the bicarbonate. Were this the only reaction taking place in so far as the oxidation of the β-hydroxybutyric acid is concerned, the plasma bicarbonate should increase 20·87 vols. per cent. As a matter of fact, it did increase from 15·7 to 39—that is, 23·3 vols. per cent. The non-protein nitrogenous constituents of the blood were increased. Twenty-four hours after the onset of the anuria 110 mg. per 100 c.cm. were present in the blood. Their value rose to 117 mg. on the following day and fell to 107 mg. before death. These values are similar to those observed in uncomplicated cases of suppression. In this case, with the chronic changes observed in the kidney at autopsy, it is quite possible, in fact likely, that the high non-protein nitrogenous content existed some time before the onset of the diabetic coma or the anuria.

[1] Van Slyke, D. D., and Wu, H.: Jour. Biol. Chem., xli., 367.

[2] Joslin, Elliott P.: The Treatment of Diabetes Mellitus, 1917, p. 89.

[3] Van Slyke, D. D., and Fitz, Reginald: Jour. Biol. Chem., xxxii., 495.

The plasma chlorides were determined by Whitehorn's[1] method and showed only a very slight diminution. The values obtained were as follows: May 30th, 1923: 4 P.M., 0·465 per cent.; 6.15 P.M., 0·458 per cent.; 31st: 10 P.M., 0·439 per cent.; June 1st: 10 A.M., 0·420 per cent.; 4.30 P.M., 0·406 per cent. During the two days the value decreased about 13·7 per cent. of the original concentration. This may have been the result of blood dilution, but no hæmoglobin estimations were made at the time to determine if such dilution were taking place.

Our thanks are due to Prof. Arthur Hall for permission to observe and record this case.

THE INTERNAL SECRETION OF THE TESTIS.

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ALTHOUGH the effects of castration have long been known to the world, only within the last half-century has it been realised that these effects are due to the body having been deprived of an internal secretion that is vital to the development of the secondary sexual characters. The actual date at which it may be said that the doctrine of the internal secretion of the testis was born was 1889, when Brown-Séquard described before a meeting of the Société de Biologie the results of his experiments upon himself with subcutaneous injections of fresh orchitic extract. This lecture not only established the fact that the testis had an internal secretion, but also laid the foundations of the whole conception of internal secretion, a conception which may have been hinted at by Berthold but had never before been clearly enunciated. To physiology this advance opened up a fruitful field for investigation, and to medicine it supplied an entirely new therapeutic weapon. Although the centre of interest afterwards shifted from the testis to the other endocrine glands, mainly on account of the greater possibilities that they offered in the way of organotherapy, the fact that it was Brown-Séquard's researches that made possible the subsequent triumph of thyroid therapy lends to the subject of the internal secretion of the testis a special interest.

But quite apart from its importance in the history of organotherapy there is attached to this subject an interest of more recent date due to the work of certain modern researchers, who have claimed that by employing means to increase the internal secretion of the testis it is possible not only to make good the defects of eunuchoidism but also to attack the symptoms of old age itself. I refer particularly to the work of Steinach and Voronoff. It may, therefore, not be out of place to review in the light of modern knowledge the whole subject of the internal secretion of the testis and to examine what means are available for augmenting the internal secretion of the testis, and what bearing these methods may have on the problem of old age. But before dealing with these problems it will be necessary to consider briefly certain questions connected with the origin, mode of action, and nature of the internal secretion of the testis. In seeking answers to the questions discussed in this preliminary article, it will be profitable to draw upon stores of knowledge amassed by workers in other branches of science, notably in the realms of biology and comparative anatomy. Biological problems will, however, only be dealt with in so far as they have a direct bearing on the subject under consideration.

The Results of the Removal of the Gonads.

The removal of the testes or ovaries has a profound influence not only on the development of the sexual apparatus, but also on the growth of the individual, on his metabolism, and even on his psychology. Most marked, however, is its effect on the development of the characteristics of sex and more particularly of those secondary characters which, although not essential to reproduction, are contributory to that act. Amongst these secondary characters of sex are the female breasts, the accessory sex glands, such as the prostate and vesicles, and the male weapons of offence and defence—e.g., the antlers of the stag, the spurs of the cockerel, &c.

It is important to remember that the severity of the effects of castration will depend on the age at which the operation is effected. Although definite changes occur, particularly in metabolism, and in the accessory sex glands, as the result of the removal of the testes from a mature individual, the outward effects of the operation are far less striking than when it has been performed in early life before the development of the secondary sex characters. In the latter case not only do such organs of sex as the prostate and vesicles fail to develop, but the whole growth and mentality of the individual is influenced so that he becomes easily recognisable from the normal male. But even if the removal of the testes be effected early in life the suppression of the secondary characters of sex is never complete. In the eunuch there appears a beard, although a sparse one, and that essentially male characteristic the margo supraciliaris is never suppressed. Moreover, if the testes and ovaries be removed from a young male and female of the same species, the adult that results is not identical in the two cases, even apart from the distinctive primary organs of sex. Differences will always be found in the general build of the two sexes, however early removal of the gonads has been practised. In other words, the tissues when deprived of the directing influence of the sex hormone still continue to develop to some extent along the original lines. It is doubtful whether complete suppression of the secondary characters of sex would be brought about even could the testes be removed very early in fœtal life, soon after their differentiation in the primitive genital trace. In this connexion the work of Meisenheimer and Kopec on insects is of special interest. These observers found that the removal of the gonads from the young larvæ of the gipsy moth (*Lymantria dispar*) was absolutely without effect on the development of the male and female adult characteristics. In their later experiments on the larvæ of the same moth they succeeded in grafting ovaries into males and testes into females, the transplanted organs persisting and sometimes becoming connected up with the genital ducts, the testis with the oviduct, and the ovary with the sperm-duct. Even in these cases the moths, on hatching, had the characteristics and instincts of the sex to which the larvæ belonged before operation, so that a male moth containing ovaries would pair readily with a normal female, and a female with grafted testes behave in accordance with its original sex when in the presence of a male.

In contrast to this may be cited the experiments of Steinach and Voronoff, who found that by cross grafting of ovaries and testes each sex could be made to assume to some extent the characters of the other. For example, Voronoff by grafting a testis into an ovariectomised goat produced horns resembling in size those of the male rather than of the female. Similarly, Steinach by means of ovaries implanted into a castrated male guinea-pig caused a hypertrophy and activity of the mammary glands of that animal. However, even in these cases a careful examination would reveal differences in structure sufficient to show that the animals did not correspond to the sex of the glands with which they had been grafted.

It would appear, moreover, that the dependence of the secondary sex characters on the gonads varies in different species, so that the results of castration are more striking in some animals than in others. Further, there is definite evidence pointing to the fact that there is a difference in the control exercised by the gonads in the case of the two sexes of the same species,

[1] Whitehorn, J. C.: Jour. Biol. Chem., xlv., 419.

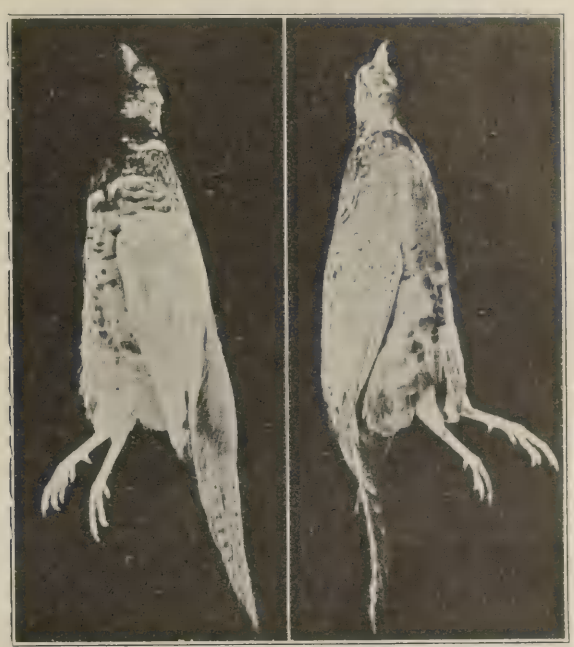
castration having a greater effect on the male in one species and on the female in another. Amongst fowls, for example, castration of the male results in the comb remaining small, the spurs poorly developed, and the male instincts suppressed. The plumage is, however, but slightly affected by the operation, so that the capon outwardly resembles a cock much more nearly than a hen. These changes may be summarised by saying that in the case of a cockerel the result of castration is infantilism. Removal of the ovary from a hen, on the other hand, causes the hen to assume to a very large extent the characters of the cock. The comb grows in size, and, what is more remarkable still, the plumage takes on to a great extent the characters of that of the cock. In other words, the result of castration in the case of the hen is not infantilism but masculinisation. The tendency shown by old hens in whom ovarian activity is on the wane to develop the attributes of the cock has indeed long been known by poultry breeders, and F. A. E. Crew has published an extremely interesting example of a transformation that occurred in a hen whose ovaries had been destroyed by tuberculosis. In this case the hen developed not only the plumage, crests, and spurs of the male bird, but also its aggressive nature, the power to perform the sexual act, and to fertilise eggs. Subsequent examination showed that the disease of the ovary had so altered the metabolism of the fowl that conditions favourable to the differentiation and growth of spermatic tissue had been created, with the result that new sex cords had been formed by the germinal epithelium. A complete sex reversal had therefore taken place. Goodale has made similar observations concerning the effect of removal of the gonads in the case of ducks, and has shown that whereas no alteration occurs in the plumage of the castrated male, removal of the ovary from the female causes the duck to assume gradually the typical plumage of the drake. It would seem, therefore, that in the case of birds removal of the ovaries has a more profound influence than removal of the testes. In mammals, on the other hand, the converse would appear to be true, removal of the testes having more effect on the development of the male than removal of the ovaries on that of the female. In human beings no direct observations are available, owing to the fact that removal of the ovaries early in life has very seldom been carried out. However, there is reason to believe that in man, as in other mammals, removal of the testes is more far-reaching in its results than is removal of the ovaries. Destruction of the testes early in life, either by operation or by disease, leads to the production of a eunuch who as regards certain characters, for example the development of subcutaneous fat, the growth of the breasts, and the distribution of the pubic hair, approaches the female. Disease or congenital deficiency in the ovaries is, however, not productive in the human being of male characteristics, but of infantilism. Masculinity in girls is not usually the result of disease of the ovaries, but of the suprarenals; new growths of that gland, as Blair Bell has emphasised, brings about precocity in boys and masculinity in girls.

These interesting differences in the response of the tissues to endocrine influence in the case of the two sexes all serve to emphasise the fact that the action of the sex hormone is not so simple as would at first sight appear. The development of secondary sex characters can no longer be regarded as resulting simply from the action on the tissues of a hormone elaborated in the gonads. The tissues play a less passive rôle than such a theory postulates, and tend to develop along certain definite lines, even when deprived of the directing action of the genital hormone. The imprint of sex has been placed on them at a far earlier date than was formerly supposed. Especially would this imprint of sex appear to have been placed on those specialised tissues that become the glands of internal secretion, so that it is not unlikely that other hormones besides those elaborated by the gonads play an important part in the development of the secondary attributes of sex. Exactly what that part is, and what action each member of the endocrine circle exerts on its fellow are, however, questions far beyond the scope of this paper. All that it is necessary for present purposes to remember is that the whole question of the influence of the internal secretion of the testis on the development of the secondary sex characters is far more complicated than was at first sight believed, and that the old view that these characters developed simply as the result of the response of plastic tissues to a stimulus supplied by a sex hormone is inadequate.

Inadequacy of the Hormone Theory in its Simplest Form.

Yet another proof of the inadequacy of the hormone theory, in its original simple form, to account for the development of the secondary sex characters is furnished by the existence of that rare but extremely

FIG. 1. FIG. 2.



Gynandromorphic pheasant.
Left lateral view showing plumage of cock and development of spur. Right lateral view showing plumage of hen bird and absence of spur.
(Illustrations kindly lent by Mr. C. J. Bond.)

interesting condition known to biologists as "lateral gynandromorphism." In this condition the individual develops characters of one sex on the right side of the body and of the other sex on the left. Gynandromorphs, although extremely rare in vertebrates, are not uncommon amongst insects. The best example of a vertebrate gynandromorph that occurs in literature is that of the bullfinch described by Poll. In this bird the male and female plumage were sharply separated on the two sides of the body, the right side of the breast being red, as in the case of the normal male, and the left side grey as in the female. On the right side there was found a testis and on the left an ovary. A somewhat similar case of gynandromorphism occurring in a pheasant has been described by C. J. Bond. In this case an ovitestis was found near the mid-line of the body containing well-marked ovarian and testicular tissue. The left side of the pheasant was male in character as regards plumage, development of the red skin surrounding the eye, the presence of a spur on the leg, and the size of the bones of the tarsus. The right side of the bird was female. Through the courtesy of Mr. Bond I have been enabled to publish a photograph of this interesting bird (see Figs. 1 and 2).

In the face of these curiosities it is necessary to presuppose that there exists a difference in the tissues of the two sides of the body, the testis or the ovary

acting as a stimulus to the development of the sex attributes rather than as a source of differentiation. In other words, in the cases of lateral gynandromorphism cited above, the localisation of sex gland and sex character in different halves of the body has a common genetic cause. They are not causally related the one to the other. As C. J. Bond has pointed out, what is true of these cases is also probably true of normal individuals, so that "in addition to the sex gland with its hormone secretion we must also recognise a somatic or peripherent factor in the causation of secondary sex characters. No amount of hormone will bring about the development of secondary male characters in individuals and in tissues in which the rudiments of such characters are absent. On the other hand, sex gland and somatic rudiments being given in heredity, the due development and the continued growth of the sex character depend on the presence of the sex gland and on the integrity of its internal secretion."

Is the Source of the Internal Secretion of the Testis in the Interstitial Cells?

It has long been known that in the testes of mammals in addition to the cells of the seminiferous tubules there are other elements lying between the tubules and known as the interstitial cells, or sometimes as the cells of Leydig. Within the cytoplasm of these cells may be seen various granules, acidophile, basophile, and pigmented, as well as certain peculiar crystals, the whole giving them the structural appearance of secretory gland cells. It is not, therefore, surprising that the theory should have arisen that these cells are responsible for the internal secretion of the testicle. This conception of the significance of the interstitial cells received such support from the experimental work of Ancel and Bouin published in 1904, that since that time the interstitial tissue of the testis has become known in French literature as the "glande interstitielle du testicule," and in German as the "Pubertätsdrüse."

Ancel and Bouin's arguments in favour of the interstitial cells forming the internal secretion of the testicle were based partly on observations on cases of cryptorchism and partly on animal experiments. They pointed out that in the retained testicle of man and of all other animals, although the seminiferous tubules are ill-formed, the interstitial cells are generally abundant. It is well known that, although a cryptorchid is usually sterile he is sexually fully developed. This association of virility with sterility can easily be explained if it be supposed that the internal secretion is formed in the interstitial cells. Moreover, the fact that in cryptorchism the interstitial cells are if anything increased rather than diminished in number would explain why an animal with a retained testis—e.g., the variety of stallion known in veterinary circles as a "rig"—is usually more excitable and sexually vigorous than an animal with a normally-placed gland.

Ancel and Bouin's experiments consisted in removing the testicle of a rabbit on one side and of ligaturing the vas on the other. On examining the testicle on the ligatured side some six months after the operation these workers found that whereas the tubules had to a very large extent degenerated as the result of the ligature a great increase of interstitial cells had taken place. This increase they regarded as a hypertrophy compensatory to the loss of testicular tissue on the opposite castrated side, and since the external secretory action of the testicle had been put out of action by the ligature, they deduced that it was the hormone-forming tissue of the gland that had hypertrophied. They also observed that in none of the animals used for this work was sexual desire impaired as the result of the operation. Indeed, in some cases ligature of the vas would seem actually to have increased the sexual appetite. As the ligature had brought about a regression of the tubules with a disappearance of all but a few spermatogonæ and Sertoli cells, Ancel and Bouin concluded that the internal secretion of the testicle must of necessity be formed entirely by the interstitial gland.

As a result, to a great extent, of this work the theory that the internal secretion of the testis is formed only in the interstitial cells has been generally accepted. Of recent years, however, various investigators have pointed out that Ancel and Bouin's proofs that the interstitial cells are the source of the internal secretion of the testis are by no means conclusive. Doubts have been expressed concerning the validity of their deductions and observations brought forward within the last few years that make it, in the writer's opinion, very difficult any longer to accept the view that the interstitial cells are entirely responsible for the elaboration of the internal secretion of the testis. Since a great deal of work, and particularly the work of Steinach in Vienna, has been based upon the assumption that the interstitial cells form the hormone if the testicle, it is worth while considering, in greater detail, the arguments that may be brought against this theory.

Arguments Against the View that the Interstitial Cells are Solely Responsible for the Internal Secretion of the Testicle.

Before reviewing the facts that stand in opposition to the theory of Ancel and Bouin, it is to be noted that a hypothesis that locates the formation of an internal secretion in the tubules rather than in the interstitial tissues is in closer conformity with what is already known of internal secretions in general. The seminiferous tubules are ectodermal in origin, and it is from the ectoderm that the glands of internal secretion are generally derived. The interstitial cells, on the other hand, would appear to be mesoblastic structures appearing in the primitive genital trace at a very early phase of embryonal development before the seminal cells have assumed their cytological character (Biedl). It is unusual for structures derived from mesoblastic tissues to assume the work of furnishing an internal secretion. Nor is the fact that the seminiferous tubules have already the work of forming the external excretion, in itself an argument against their being responsible for the elaboration of the internal secretion as well, for we have the well-known precedent of the hepatic cells that are responsible for both the glycogenic and the biliary function of the liver. On a priori grounds, therefore, the view that the internal secretion of the testis, as well as the external, is formed by the cells of the tubules is not unlikely.

For the sake of brevity, the arguments in favour of the internal secretion being formed by the tubules of the testis may be summarised as follows:—

1. Although it is true that there is no spermatogenesis in the tubules of the cryptorchid the germinal cells of the tubules are always present, as well as the interstitial cells. The possibility, therefore, that it is in the former rather than in the latter cells that the internal secretion of the testis is formed can never be altogether excluded. No case has yet been recorded of the development of secondary sex characters in the complete absence of all tubular elements.

2. The commonest type of hermaphrodite found in man is an individual with the secondary sex characters of the female (breasts, hair development, distribution of fat, psychology, &c.) and the primary sex glands of a male. A section of the testicle in such a hermaphrodite always reveals the presence of numerous well-formed interstitial cells which, as in the case of the testicle of the cryptorchid, are generally increased in number. If it be assumed that these cells are the seat of formation of the internal secretion, it is difficult to understand why in the face of this superabundance the secondary male characters of the hermaphrodite should have entirely failed to develop.

3. Although ligature of the vas produces definite changes in the tubules, these changes are generally in the nature of regression rather than of complete destruction. After ligature the spermatoblasts, spermatocytes, and, to a variable extent, the spermatogonia, disappear, but the cells of Sertoli escape, so that the possibility that these elements form the internal secretion can never be excluded. Moreover,

the action of the ligature is not permanent, since if the examination of the testicle be postponed, say, for a year after ligature, a rehabilitation of the tubules will be found to have taken place. That this regeneration of the tubules is not due to any re-establishment of the patency of the vas is proved by the fact that the lumen of the vas, as well as that of the tubules, is found to be distended with fluid. These observations of Steinach on the temporary nature of the results produced by ligature of the vas have since been confirmed by other workers, and notably in experiments on dogs.

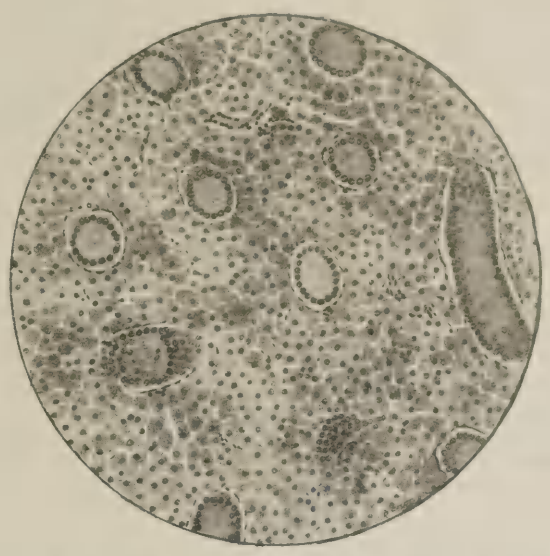
4. Lipschütz has shown by means of partial castration experiments carried out on animals that there is no normal relationship between the number of interstitial cells in the testis and the degree of masculinisation of the animal. Although masculinisation never occurred in the absence of interstitial cells, he found that as little as 1 per cent. of the total tissue of the testes was sufficient to bring this masculinisation about. In the face of this observation it is impossible to agree with Ancel and Bouin that the increase of interstitial cells seen in their ligature and castration experiments was in the nature of a hypertrophy compensatory to the removal of the testis on the opposite side.

5. In many of the lower animals, such as the triton, no cells resembling the interstitial cells of the mammalian testicle can be found. It is difficult to believe that in the higher animals a transference of the endocrine function from the tubules to the interstitial cells could have taken place, since this would mean that a function originally due to epithelium had been handed over to connective tissue.

6. Voronoff and Retterer have shown that when a testicular graft is removed and examined histologically it is found to be composed entirely of cells derived from the tubules. These resemble in appearance the cells found in the tubules of an infantile testicle, and a careful search shows that the interstitial cells have completely disappeared. Nevertheless, these grafts in the case of Voronoff's experiments with castrated goats had been sufficient to bring about the masculinisation of the animal, and were, therefore, it is to be presumed, a source of sex hormone. My own observations, to be described later, confirm this view that the interstitial cells rapidly disappear from testicular transplants, the germinal cells of the tubules alone surviving.

7. In animals whose sexual activities are subject to a seasonal variation, a definite cycle of change may be observed to occur in the histological appearance of the testis. This cycle has been studied by different observers working with different animals, and although discrepancies occur in their interpretation, the balance of opinion would appear to be that the changes seen are not such as to support the view that the interstitial cells are the source of the internal secretion. Champy, in studying the testes of the batrachia, noted the presence of a large number of interstitial cells during the period of rest. These disappeared with the onset of the period of sexual activity. In the dormouse and the camel, who breed only in summer, and in the kangaroo and the stags, both of whom have an equally restricted mating season, he noted the same phenomenon. On the other hand, Stieve, in studying crows, arrived at the conclusion that the interstitial cells undergo no modification either qualitative or quantitative during the seasonal development of the testis, but that the tubules increase considerably in size. Benoit, however, repeating this work on certain tropical birds, maintained that there does actually occur a hypertrophy of the interstitial tissue, but that the hypertrophy is obscured by the great increase in the total volume of the testis that takes place at this time. My own observations on this subject have been made on moles who have a short breeding season during January and February. If a section of the testicle of a mole be examined in autumn, it will be found that the interstitial cells are so abundant that in a rough calculation they must form four-fifths of the total volume of the testis. When suitably stained the cytoplasm is seen to contain numerous granules of lipoid material. The tubules, on the other hand, are in a resting state, and there is a total absence of spermatogenesis (see Fig. 3). At the beginning of December the picture is somewhat similar, but the relative volume of the interstitial cells to the tubules has diminished. In January and February the

FIG. 3.



Section of testis of a mole in September, showing enormous development of the interstitial cells associated with a condition of rest in the tubules. Section stained by Scharlach R. to show the lipoid granules with which the interstitial cells are heavily charged.

tubules have increased enormously in volume and the interstitial tissue has become relatively insignificant.

Whatever may be the significance of this cycle of changes occurring in the testes, it is difficult to find any satisfactory explanation based on the supposition that the interstitial cells are the source of the internal secretion. If Ancel and Bouin's theory is correct, why do the cells responsible for the sex hormone loom so large at a time when the sexual activity of the animal is nil, and how can we explain their gradual diminution as the period of rut draws nigh? Some other explanation of the rôle played by the interstitial tissue must be sought.

The Function of the Interstitial Cells.

If the interstitial cells do not form the internal secretion of the testis, what is their function? The most probable answer to this question is that they are trophic cells, whose part it is to take up nutritive material from the blood and to pass it on to the tubules. Régaud, indeed, has shown that some such substance does in actual fact pass from the interstitial cells to the cells of Sertoli.

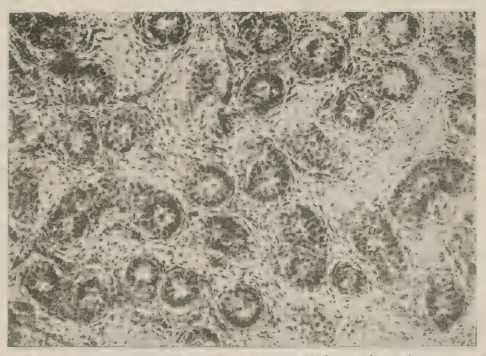
The testes, especially those of animals with a rutting season, are, as we have seen, subject to great changes in their state of activity. From the condition of rest they are plunged into one of intense activity, and in the case of the animal with a limited breeding season this change is associated with a great increase in the size of the tubule. In order to facilitate this sudden change from rest to activity the existence of a store of nutrient material ready at hand is of great importance, and it is in those animals in whom the change from rest to activity is most abrupt that this convenient store of material is actually found, in the form of large masses of interstitial cells heavily laden with lipoid granules. In animals, like man and the dog, who are capable of breeding all the year round, and on whose testicle no sudden demands are made, the warehouse of interstitial cells is comparatively small.

If we turn from comparative anatomy to a study of the development of the human testis from fœtal life until the onset of old age, again we find facts that suggest that the interstitial cells furnish a storehouse of nutritive material for the tubules rather than an internal secretion.

The Interstitial Cells from Birth to Old Age.

A microscopic section of the human testis at or just before birth resembles that of a mole during the resting season, inasmuch as the interstitial tissue appears more abundant than the tubules (Fig. 4). When suitably stained and examined under a high power many of the interstitial cells are seen to be full of a lipochrome substance distributed in the form of granules throughout their cytoplasm. In the seminiferous tubules no differentiation of the cells has at this time taken place. After birth a fairly rapid increase in the seminiferous tubules occurs, so that at four months they would appear to have nearly doubled in size (Mott). During this period of rapid development of the tubules the interstitial cells become less plentiful and the cytoplasm of those that remain appears less heavily charged with granules than was the case at the time of birth (Fig. 5). The testicles maintain this condition until about the time of puberty, when a great increase in the interstitial cells is again noted the increase being followed by a rapid development of the tubules and by the appearance therein of active spermatogenesis. Throughout the years of vigorous sexual life the interstitial cells remain more or less constant, but with the onset of decline there occurs a slow diminution in their size and number. So long as spermatogenesis persists some interstitial cells are usually to be found, but with the cessation of the reproductive function they disappear. As, however, spermatogenesis is sometimes found in the testes of

FIG. 4.



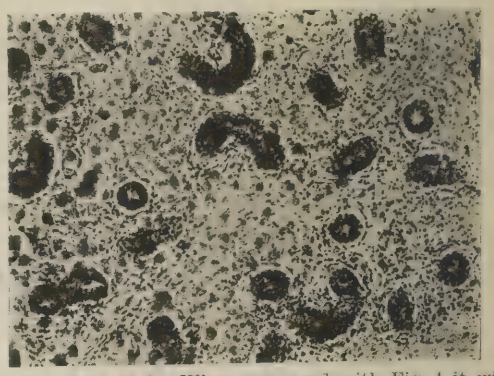
Testis of a twin fœtus showing a condition that is comparable to that seen in the testis of a mole during resting season. Between the tubules are a number of interstitial cells.

very old men the interstitial cells may in actual fact persist to a ripe old age.

The theory that the interstitial cells are trophic explains the single, life-long cycle of the human testis as satisfactorily as it does the annual cycle of the rutting animal. In each case the period of rapid growth of the tubules is preceded by a great accumulation of interstitial cells and lipoid granules. In the human being the periods at which this accumulation occurs is at birth and just before puberty; in the rutting animal it is during the season of rest. In both cases the number of interstitial cells diminish pari passu with the development of the tubules and the appearance of spermatogenesis. Equally satisfactory is the trophic theory in supplying an explanation of the appearance of the testis in cases of cryptorchism. In the cryptorchid the development of the testis has for some reason or other stopped short of spermatogenesis. What the actual cause of this arrest may be is immaterial, the point of importance being that the tubules remain inactive, and that as a consequence of this inactivity nutritive material accumulates in the interstitial tissue. The supply of trophic material here exceeds the demand.

So is it when an arrest of activity in the tubules is artificially produced by such an operation as ligature of the vas. Vasotomy, as Ancel and Bouin showed, is followed by regression in the tubules and an increase of interstitial cells. Their observations are correct but the deductions they draw from these observations are fallacious. The increase in the interstitial tissue is in the nature not of a compensatory hypertrophy but rather of an accumulation from disuse. Although

FIG. 5.



Testis of a child of 3. When compared with Fig. 4 it will be seen that a marked increase in the tubules has occurred at the expense of the interstitial cells, which in this section have entirely disappeared.
(Blocks of Figs. 4 and 5 kindly lent by Sir Frederick Mott.)

the sexual vigour of the animal may, as Ancel and Bouin observed, be augmented by ligature of the vas, this exaltation is not the direct result of the increase of interstitial cells. No direct relationship can be established between sexual activity and richness in interstitial cells. Stieve has, indeed, shown that the stuffed geese of Strasbourg possess more interstitial cells than normal geese, and that nevertheless they are less active sexually than the normal animal. Prominence of interstitial cells usually means accumulation of nutritive material, the surplus being due either to over-feeding or else to under-action of the tubules.

Roughly speaking, in the healthy testicle the prominence of the interstitial cells is inversely proportional to the activity of the tubules. With the onset of old age or in disease this balance is upset, so that a decline in the activity of the tubules is associated with a diminution in the interstitial cells. Complete degeneration of the germ cells is invariably followed by an equally complete degeneration in the interstitial cells.

Conclusions.

The conclusions that may be drawn from the above may be tabulated as follows:—

1. That although the testis, through the medium of its internal secretion, exerts an important influence on the development of the secondary sex characters, its acts as a stimulus to their growth rather than as the source of their origin.

2. That the other organs of internal secretion, such as the pituitary and the suprarenals, exercise a control over the development of the secondary sex characters which is only of less importance than that exercised by the testicle itself.

3. That the influence exerted by the various endocrine glands on the development of the sex characters differs in different animals and in the two sexes.

4. That the internal secretion of the testis is formed not by the interstitial cells but by the cells of the tubules.

5. That the interstitial cells store up nutritive material for the use of the tubules, their function being, therefore, trophic rather than secretory.

It is obvious that these conclusions have an important bearing on the organotherapy of the testis. If the internal secretion of the testis is only one of the factors regulating the development of the secondary sex characters it is obvious that too much must not

be expected of treatment by orchitic extracts or by testicular grafts in those cases of eunuchoidism in which deficiencies in the rest of the endocrine system exist. Moreover, if the interstitial cells do not form the internal secretion of the testis, the observation that they increase in number after the operation of vas ligature cannot be taken as a proof that the output of sex hormone has been correspondingly increased. In other words, if the function of the interstitial cells be trophic rather than secretory, the arguments in favour of Steinach's operation that are based purely on the histology of the testis after ligature fall to the ground.

These practical points will be discussed fully in a later paper dealing with the treatment of testicular insufficiency by means of testicular grafts and by Steinach's method of ligature of the vas.

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SCHISTOSOMIASIS IN CHINA:
BIOLOGICAL AND PRACTICAL ASPECTS.[1]

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FOLLOWING the discovery of a Japanese variety of schistosoma, *S. japonicum*, by Katsurada (1904) and Catto (1905), and the description of its ova as found in fæcal examinations, several missionary physicians in China observed in their clinics the presence of similar ova in stools of patients who suffered from Hankow fever, Kiukiang fever, Yangtze valley fever, urticarial fever, or some other locally-named malady. This Japanese form of schistosoma came to be accepted as an entity in China, but it occurred to me, in association with my colleague Dr. Henry Edmund Meleney, that the identity of the Chinese form with the Japanese worm must be established, and its life-history demonstrated, before further progress could be made in attacking the disease. We discovered a Chinese mollusc serving as an intermediate host, and this enabled us to tackle certain practical phases of the problem.

Plan of Investigation.

The course of events in the investigation which we carried out was as follows: (1) The development of the miracidium-sporocyst stage of the Chinese worm was first demonstrated in the Japanese snail. (2) The Chinese intermediate host was discovered in the Soochow area, and the experimental proof established that this was a true intermediate host of the worm, by infecting mice with cercariæ from infected Soochow snails, and infecting uninfected Soochow snails with miracidia hatched from Chinese eggs. (3) The development of the Japanese worm in the Chinese snail was then demonstrated.

The proof of the ability of the Chinese worm to develop in the Japanese snail was made possible through the gift of a large number of uninfected *Blanfordia nosophora*, which Prof. S. O. Yoshida, of Osaka, Japan, sent me in December, 1921. In February, 1922, we had under observation a Chinese patient with schistosome eggs in the stools. The stools of this patient were washed for several days, the miracidia hatched out, and a number of the Japanese snails subjected to infection. Previous to this time we had found that the ordinary molluscs of the Peking area—*Viviparus quadratus*, *Planorbis möllendorfi*, and *Lymnæa plicatula*—could not be infected with this species of miracidium. In the case of specimens of Blanfordia, however, the miracidia became positively attracted to the snail as soon as they came within a few millimetres of it, and proceeded to attack the nearest part of the mollusc. In this way a series of *Blanfordia nosophora* was obtained, infected with miracidia of *Schistosoma japonicum* from Chinese sources. This demonstrated clearly that the Japanese intermediate host of *Schistosoma japonicum* was susceptible to an infection of schistosome miracidia from a Chinese source. This led us to postulate that the molluscan host in infected districts in China must be either the same species of mollusc or a closely related one.

In order, then, to know the condition under which the snail was to be found in China, we studied the bionomics of the Japanese species, its preference for certain types of water, its relation to the various water levels, and the damp soil stratum immediately above the water line, as well as the level of the water at which it was attacked by the miracidia. From our observations we predicated that the snail would be found only near quiet, clear, shallow water; that it would more likely be found on overhanging moist banks at the edge of the water than in the water itself, and that infection by the miracidia would ordinarily occur just beneath the water level. We then chose Soochow, an endemic centre in the lower Yangtze Valley, where conditions were favourable for study, and during the month of August, 1922, Dr. Meleney undertook to discover the intermediate host of *Schistosoma japonicum* for that area. He made the Soochow Hospital his headquarters, and in coöperation with Dr. J. A. Snell, entered upon a search for the mollusc in the region immediately to the north and east of Soochow city, where clinical cases were known to occur. The party left Soochow by motor-boat along the main canal, passed north to the railroad bridge, thence by way of a secondary canal into a region which had frequently sent cases to the hospital. After some search in the rice fields, where only dry shells were found, a man was encountered with marked clinical symptoms of schistosomiasis japonica. Examination of fæcal specimens from persons hailing from a small village in the vicinity revealed eggs of *Schistosoma japonicum*. The village was observed to be on a terminal canal, and examination along the overhanging banks of this waterway just above the water's edge disclosed many specimens of a minute tapering snail, in many respects resembling *Blanfordia nosophora*. The snails were taken back to the hospital laboratory and dissected in the usual manner; 28 per cent. of the snails contained schistosome cercariæ, while one snail contained an oculate fork-tailed cercaria. The former were placed in a museum jar in water, and laboratory mice were submitted to infection. Fourteen days later one of these mice was autopsied, and about 100 immature schistosome worms were obtained from its liver and mesenteric veins. Another mouse was kept until the thirty-first day, when examination at autopsy revealed the presence of many mature male and female schistosome worms morphologically similar to Japanese specimens which we had previously studied. Some of this same collection of snails harbouring cercariæ were later taken to Peking and used to infect mice which had been born in Peking, and had, therefore, never been near an endemic area. Another collection of the same

[1] Abstract from an address recently delivered before the Royal Society of Medicine (Section of Tropical Disease and Parasitology).

species of snails within the city of Soochow, from the bank above the water's edge, was found to contain no infection, so they were submitted to an invasion of schistosome miracidia hatched out from local material. The snails were taken to Peking and kept in moist earth. After about three months they were placed in water, where they discharged large numbers of schistosome cercariæ, which were used to infect dogs. Many other species of snails from the Soochow area were collected and examined, but none contained the schistosome cercariæ. When examined later, none of these subjected to invasion by miracidia hatched from eggs of *Schistosoma japonicum* harboured schistosome larva.

In order to complete our proof of the ability of the miracidia of *S. japonicum* to infect any member of the group of closely related snails, certain of the Soochow schistosome snails that were known to be uninfected were submitted to an infection with miracidia hatched from eggs obtained from the fæces from dogs that had been infected with Japanese material. These were equally infectible; the miracidia readily attacked them. On examination about ten weeks later these snails contained mature and maturing cercariæ. The mollusc harbouring the schistosome cercariæ from the Soochow area has been kindly identified for us by Mr. Bryant Walker, of Detroit, Michigan, who regards it as *Oncomelania* (*Hemibia*) *hupensis*, Gredler.

Life-History of Schistosoma Japonicum.

The purpose of this portion of the study as worked out by us was twofold: (1) To obtain certain biological and morphological data in respect to the worm which were doubtful or obscure; and (2) to determine certain phases of the life-history which might be used as barriers in undertaking control of the infection.

The egg of *Schistosoma japonicum*, when first laid by the female, is a double convex oval disc, with a thorn or abbreviated spine on one side near the anterior end. It is always present in the immature eggs, but is usually much less conspicuous in the mature egg. The mucoid secretions from the lateral glands of the miracidium within the egg-shell ooze out through the shell and serve as an outer sticky cover for the egg. The eggs hatch best in a water medium, where fermentative agents are reduced to a minimum. In pasty stools exosmotic phenomena soon set in and produce the death of the miracidium within the shell. The miracidium dies in a medium above 45° C., but will survive a temperature of 4° C. for months at a time. It will live in freezing temperatures for a brief period (as low as minus 17° C. for an hour or less) provided the medium is water and not fæces. It seems probable, therefore, that the eggs can survive all water conditions which obtain in endemic areas, but soon become non-viable in night-soil dumps which are exposed to the weather.

The miracidium of *Schistosoma japonicum* displays a chemotactic response, not only to the susceptible mollusc when this chemotaxis is once established, but also to the mucus secreted by the mollusc. Experimental data show that all soft parts of the susceptible snail are not only equally liable to attack, but also to penetration. In other words, there is no selective penetration since invasion through the tissues of the head is as common as penetration of the gill filaments. In the former case, as in the latter, the miracidium penetrates the tissues *as a miracidium*, with its full equipment of cilia and secretory glands. Several days elapse before these structures disappear. In the meantime the larva has either secured entry into the lymph spaces of the mollusc or has developed an artificial lymph space around itself: sooner or later it gains access to natural lymph channels. The development of primary and secondary sporocysts, and the development of the fork-tailed cercariæ to maturity require a period of seven to nine weeks. Under natural conditions in the field, seven weeks is probably the period ordinarily employed.

It appears that the mature cercariæ accumulate within the snail until a certain tension of the host tissues develops, when they erupt spontaneously. When infected snails which have been dry for some time are placed in water they discharge their brood within a few hours. If they are taken out of water and placed in dry earth for a period, then later returned to the water, a second discharge usually results, although this is not ordinarily as heavy as the first. Cercariæ of *Schistosoma japonicum* ordinarily swim out of the snail-shell tail first, employing an anchor-fluke movement. Soon after a brood has been discharged they are seen to congregate under the surface-film of the water immediately above the snail, where they become pivotted by the attachment of the ventral sucker to the surface-film. Any object which comes in contact with this surface-film is likely to remove cercariæ from the water. It seems probable, therefore, that the actual first contact of a schistosome cercaria with a suscepible mammal is a fortuitous one, and is not superinduced by a chemotactic stimulus as is that of the miracidium for the susceptible mollusc host.

Invasion of the Mammal through the Skin.

The cercaria attacks the skin with the capillary ends of its cephalic ducts, pouring out through them the proteolytic ferments secreted by the cephalic glands. During this period, if not before, the tail of the organism is dropped, so that the larva enters the mammal not as a cercaria but as an agamodistome. Penetration may be effected in a few hours or may require a longer time. The earliest stage at which we have been able to recover young living worms from experimental animals is 23 hours after infection, when specimens were obtained from the popliteal lymph-node of the rabbit. It usually requires two days or more for them to reach the venous circulation. They pass immediately through the heart to the lungs, where a certain number, particularly in heavy infections, penetrate the tissues of the lungs, producing lesions thereby, and thus reach the pleural cavity. They become side-tracked here, however, and, unable to continue their course, degenerate in a few days. The majority, however, pursue the normal course and pass through the capillaries of the lungs into the arterial circulation. They apparently have an equal distribution throughout the systemic circulation, since at this stage they are recovered from peripheral, renal, and splenic arteries, as well as from the mesenteric system. But only those that get through the mesenteric capillaries into the portal system arrive at a suitable location for growth. The others behave as foreign-body emboli, and are probably the cause of the dermatitis observed early in the infection. The course within the body is, therefore, one definitely involving blood-channels.

Development and Pairing of Adult Worms.

While a certain development takes place during the migration from the skin to the portal system, functioning of the digestive tract takes place only after arrival within the portal vessels. It seems highly probable that the young schistosomes first pass into the intra-hepatic portion of the portal vessels, where they reside until sufficient muscular development has been attained, so that they may crawl back into the mesenteric veins. Here they mate (at about the seventeenth day) and become adult, some as early as the twenty-fifth day. Worms at this time lie in the smaller mesenteric veins and even in the capillaries, where the eggs are laid, and, by pressure, and later by digestive ferments from the miracidium within, break through to the intestinal lumen.

During the migration from the skin to the portal system, but more particularly later within the portal system, the worms respond to a definite growth stimulus. Our first experimental worms were recovered from the liver 70 hours after infection, but migration from the lungs continues through to the seventh day, after which time the worms are too large to pass the capillaries, and, having used up all of their digestive-gland secretions, are unable to migrate of their own accord.

Distribution of Schistosomiasis in China.

Altogether the endemic territory in China is much more extensive than the five known infected districts

in Japan. The latter amount to considerably less than one-tenth the known territory endemic for the disease in China, and are, in reality, minute replicas of the Chinese area, although on the whole they are probably more intensively infected. While foreign sport dogs are commonly found to harbour the disease in endemic areas in China, native dogs are less heavily infected, possibly due to their dislike for water. In China man alone is the important definitive host of the disease.

Diagnosis and Therapy in Schistosomiasis Japonica.

Little careful study has been made in China of the early stages of schistosomiasis. The natives do not seek medical assistance for the infection until it is far advanced, while most early cases which are diagnosed by the presence of eggs in the fæces are usually afflicted with more serious complications.

Houghton (1910) has classified the advanced cases as follows: (*a*) Typical cases, with large liver and spleen, and with fluid in the peritoneal cavity and blood and ova in the stools. (*b*) Cases showing only splenic enlargement, with or without blood or ova in the stools. (*c*) Cases negative except for marked eosinophilia. (I have indicated my doubts about the specificity of a high eosinophil count under such circumstances.) (*d*) Latent cases, showing ova in the fæces, but no bodily reaction.

The earlier treatment of schistosomiasis in China was entirely symptomatic. In Japan quinine and arsenicals were tried without success. In 1913 Hutcheson used emetine on some of his cases in Kashing, and believed that the drug deserved further trial. Following the introduction of tartar emetic treatment for Egyptian bilharziasis by Christopherson in 1917–18 certain hospitals in China undertook to use this drug in their schistosomiasis clinics. In all cases within my knowledge the patients have been taken into the hospital and treated in the wards. Clinicians in China, who have given tartar emetic a trial, agree that "results are uniformly good when patients have stayed in the hospital until pronounced cured, and when complications have been avoided." Tootell (1923), of Changteh, Hunan, reports cures for 50 per cent. of all patients who received treatment, while 29 per cent. more were improved, although they still harboured eggs on leaving the hospital before treatments were completed. In other centres where the treatment has been given a fair trial similar success has been attained. Although Reed (1915) regards emetine as ineffectual, Tyau (1922) favours its use.

Control of the Disease in China.

Prophylactic measures have been undertaken under government supervision to wipe out the molluscs in the endemic areas of Japan. The most successful and practical method yet devised consists in liming the banks along the infected or suspected canals and drainage ditches. In China, the simple but effective measures adopted by the Japanese are still impracticable. In the first case the intermediate host is known as yet only in the immediate vicinity of Soochow, Kashing, and Shaohsing. While the distribution of the disease leads one to believe that the mollusc involved has the same habits of existence in all endemic centres in China, the actual proof yet remains to be demonstrated. In the second place, the whole endemic territory in China is a tremendous one. Neither the disease nor the mollusc is equally distributed over the Yangtze Valley. The infected areas are confined especially to certain districts, such as Soochow, Kiukiang, and Changteh. A practical programme involves a search for the intermediate host in such areas of heavy endemicity, gradually working out from these centres to the districts of lesser infection. It must be remembered, however, that such a programme requires considerable skill on the part of the surveyor, since the mollusc is minute, is easily confused by the layman with immature specimens of the ubiquitous *Melania cancellata*, and is unknown to the natives. On the whole the problem in China seems more likely to be solved on the basis of night soil control. One more fact must be kept in mind in considering such an undertaking so intimately concerning the native farming class—namely, their suspicion that only harm can result from any stranger trespassing on their domain. Coupled with this is the improbability of securing any government coöperation at the present time in China. In spite of these unpleasant facts, the problem of eradicating schistosomiasis from China is ultimately a hopeful one. One must bear in mind that China is an ancient country, that she moves slowly and deliberately, but that she moves surely. The next 50 years will bring much in the way of reorganisation and development in China. It seems not too much to expect that public health and preventive medicine will follow closely upon the steps of improved agriculture and commerce, and that in this scheme of affairs schistosomiasis will not long be allowed to remain an uncontrolled infection in the heart of the country.

Summary.

In working out the problem of schistosomiasis japonica for China, the development of the miracidium-sporocyst stage of the Chinese worm was first demonstrated in the Japanese intermediate host, *Blanfordia nosophora*.

Following this the Chinese intermediate hosts were discovered in the vicinity of Soochow, Kashing, Shaohsing, Fatshan, and experimental proof of their right to this claim was established.

The development of the Japanese worm in the Chinese snail was then demonstrated.

The important factors in hatching of the egg are the maturity of the miracidium and lack of fermentative agents in the medium. The larva withstands cold, but dies at temperatures above 45° C.

The miracidium may enter the tissues of the molluscan intermediate host either by way of the gill filaments or by penetration through the solid tissues of the head or foot.

The cercaria attacks the skin by pouring out proteolytic ferments through the capillary ends of the cephalic ducts, thus digesting and mechanically battering its way through the skin of the definitive host.

Penetration once effected, the young worm utilises the blood channels for its migration through the body to the portal vessels, normally passing through the capillaries of the lungs and thence by way of the left heart into the systemic circulation. While the chances are equal that the worms will pass to all parts of the systemic circulation, only those that pass through the mesenteric capillaries into the mesenteric veins are able to continue growth. Mating has been observed as early as the seventeenth day, and mature eggs have been found in fæces 28 days or later following infection.

The disease, schistosomiasis japonica, has a wide distribution throughout the Yangtze Valley, but is particularly well established in the regions around Soochow, Kiukiang, Tsaoshih, Wuchang, Yochow, and Changteh. It has been located in isolated districts on the central Szechuan plain, in southern Chekiang, at Foochow, above Swatow, and on the North River above Canton.

With a full course of tartar emetic treatment available, about 50 per cent. of the patients suffering from schistosomiasis are cured, while another 29 per cent. are improved. Still others come for treatment too late to secure effective therapeusis. Antimony tartrate is, in most cases, specific for the infection.

While the methods adopted in Japan for eradicating the mollusc host are still impracticable in China except in certain limited areas, it seems reasonable to believe that in the course of a few years measures will be effected to stamp out the infection in China.

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THE DEVELOPMENT OF MODERN ANTI-MALARIA CAMPAIGNS.

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UNTIL an absolutely certain and specific remedy for malaria, in the form either of a protective serum or vaccine or curative drug is discovered, the disease must on the large scale continue to be fought indirectly and somewhat expensively by waging war against its anopheline vectors. Even then, unless the serum, vaccine, or drug were to have the improbable power of inducing a comparatively permanent immunity to malaria, the disease, in its hot-beds, would still have to be combated by campaigns against its vectors. To-day, all over the world, owing to the great increase in wages of even manual labour in the tropics, the expensiveness of this only satisfactory means of fighting malaria is so marked as to cause considerable embarrassment to continued anti-malaria work in many regions. While labour was cheap, obviously it mattered little whether more than the strict essentials of the work were carried out, and we could adopt as our working principle "oil, drain, or fill up all anopheline breeding places in malarious districts"—a simple and satisfactory principle, but one which by recent intensive study of anopheline bionomics we see actually incurs much unnecessary work.

Formerly, working on the old principle, it was sufficient to determine the presence of anopheles locally, and the anti-malaria measures could be safely left in the hands of sanitary engineers and drainage experts. Beyond demonstrating that anopheline larvæ were in the ponds, marshes, streams, &c., and that they no longer existed after the work had been completed, the services of the entomologist were practically uncalled for. Now that the cost of labour has so greatly increased we have discovered that the old principle of developing a sweeping attack against all the anopheline breeding places in a given area, however good the final results may be, is comparable in its extravagance to engaging an enemy on every front, when by a slight study of the tactical position a few master strokes would bring victory without a tenth of the effort or expense.

The new principle to be applied to modern anti-anopheline projects may be defined as "drain or fill up *only* the breeding places in which the *definitely proved* anopheline vector is to be found—disregarding all other waters, no matter how 'typical' they may appear." In following this new principle the full services of skilled entomologists are the foundation and insurance of successful work. In work of this kind, *ipso facto*, the entomologist must rank as general and chief of staff, as it is upon his investigations and plans the success of the campaign depends. Anti-anopheline work is purely entomological work, and modern anti-anopheline work demands the most careful bionomical study of the particular species of the anophelines which are to be dealt with.

Failure of the Mauritius Campaign.

I need only indicate the position and the causes of failure of the anti-malaria campaign in Mauritius, which I have studied recently, to make this point clear. Primarily, owing to insufficient entomological investigations, it had been assumed that only one definite vector of malaria existed in the region. No study of the local specific bionomics of this species had been made, and an extensive and costly anti-anopheline campaign was started with no less an aim than the eradication, as far as possible, of all actual, and what were considered to be potential, breeding-places. No definite plans were evolved other than the oiling, draining, or filling in of what were considered typical noxious waters; the "natural balance" in nature was neither studied nor considered except in so far as assuming that by the importation of large numbers of larvivorous fish the anopheline larvæ would be effectually checked. Moreover, the services of an entomologist had not been utilised for 15 years, the whole of the work being left in the hands of willing but quite out-of-date sanitarians.

After a modern survey of the situation it was found that instead of one anopheline vector three were actually responsible for the intensely malarious condition of the region, and furthermore, that the species formerly regarded as the vector, possibly in certain parts of the island ranked only second in importance. Also it was found that much of the anti-anopheline work which had been accomplished was unnecessary; worse still, by the manner of its execution this work had, in some localities, provided good breeding conditions for what was found to be the other important vector. In addition, it was discovered that waters which had been looked upon as harmless harboured two of the vector species, while another unconsidered type of water harboured the third vector. Naturally all the efforts of the existing anti-malaria organisation had largely failed to produce any amelioration of the malarious condition of the country, and the whole position was to be accounted for simply by the absence of a competent entomologist who could have directed the campaign according to the tactics he found necessary under the local conditions.

Necessity of Dealing Only with Proved Vectors.

Recent study has shown that efficient and economical anti-malaria campaigns can only be attained by the most precise investigation of the bionomics of the local anopheline vectors, so much so that immense dissipation of effort and money is likely to take place unless a full account of the bionomics is available. The old principle of "oil, drain, or fill-in all dangerous waters," in other words, must be relegated to the past as both extravagant and totally unscientific. In an area where malaria is rife obviously the initial investigation should be to determine what species are present, and since the malaria-infectivity of the anophelinæ varies from zero to a high percentage, which species are locally concerned with the transmission of the disease. By modern technique the latter question can now be quite easily determined experimentally, as most of the factors governing mosquito infection and mosquito life in captivity have been ascertained.

It will usually be found that, at most, one or two species in any given region are the important vectors. Hence the necessary anti-anopheline measures are at once narrowed down to dealing only with these proved vectors, and need not involve any attempt at a general slaughter of all anophelines. It then becomes essential to determine the larval and pupal characters of the incriminated anopheles, so that these shall be easily recognised in all their stages of development; and when this is accomplished careful study and registration of all the breeding places must be undertaken. Recognition of the types of breeding places is highly important, but even more important is the registration of the breeding places where the larvæ are actually found.

Underlying the supreme importance of this registration is the common but at present incompletely explained phenomenon that waters with apparently identical geographical and physical characters do not always afford breeding places to the anopheles. Frequently certain waters may harbour innumerable larvæ of the noxious species, while even within a stone's throw of these breeding places, in other seemingly identical waters, no larvæ are ever to be found. Apparently this is due to variations in the pH reaction of these waters, and I have found the use of pH indicators of the greatest value in determining whether any particular water affords normally suitable conditions for anopheline development. It has been found that most of the anophelinæ—probably all except the tree-hole breeders—demand waters with either a neutral or alkaline reaction, and that waters with an acid reaction are unsuitable as breeding grounds. Obviously, therefore, the initial work of the anti-malaria staff is again narrowed down to dealing primarily with the registered breeding places, and not generally with waters of a certain type. Thus the enemy is attacked at once at the positions of its greatest concentration; heavy slaughter follows, markedly reducing with a minimum of effort the numbers of anophelines in the locality. Observation must, of course, be kept upon the apparently identical waters in the vicinity to ensure, with the main breeding places destroyed and with possible changes in the pH index, that the species does not resort to waters from which it has been formerly absent.

In my experience, however, I have found that apparently similar waters which are unsuitable to the species under normal conditions rarely alter. The inimical qualities of these waters, under normal conditions, are usually too great to permit the larvæ to adopt them even when the naturally suitable breeding places no longer exist. Not infrequently I have found in the study of the breeding places of malaria vectors that the types of the breeding places of certain species are so peculiar as to limit the necessary anti-anopheline measures to an astonishing degree, indicating the immense extravagance and futility that widespread oiling, draining, and filling-in operations would involve.

"Natural enemies" in mosquito control are still sympathetically regarded by some people. The idea of utilising a natural force to undertake the necessary labour for us is, I admit, attractive, and not without its element of romance, but I maintain, after attention to this question for many years, that in most anti-malaria campaigns the successful utilisation of "natural enemies" in anti-anopheline work is impossible. Under unnatural (artificial) conditions larvivorous fish are the only "natural enemies" that, in a limited manner, are useful in the destruction of mosquito larvæ. Under natural conditions larvivorous fish have practically no influence in the reduction of the numbers of the larvæ. The fish have to toil for each larva they consume, and Nature's balance provides the larvæ with barriers against the attack by fish—the result being that where one larva is killed, provision is made for the development of another. Consequently, in anti-malaria campaigns, except in artificial mosquito breeding places, such as water tanks, ornamental ponds, drains, &c., fish are useless, and are apt to engender a false faith in palliative measures when direct and ruthless action for the abolition of the breeding places is the only policy of real value.

Propaganda and Instruction.

In all parts of the world to-day, by the conspicuous racial and individual development of peoples, anti-malaria measures which in the past would have been accepted in dumb faith are now frequently brought sharply under public criticism, for good or ill, according to the degree of public enlightenments Careful propaganda and instruction to communitie. by those in charge of modern anti-malaria campaigns is, therefore, of the utmost importance, and the foundations of success are to be laid by preliminary discussion of the objects with the leaders of the communities, followed by concurrent instruction of the people as each of the details of the campaign is undertaken. Each individual who understands the aims thus becomes a nominal member of the anti-malaria staff, and can be made to render invaluable service and relief to the efforts as a whole, instead of developing a policy of obstruction by regarding himself as subject to irritating and needless obligations.

Since it may be said that the foundation of economic and modern anti-malaria campaigns lies in the adoption of direct and permanent measures against only the proved breeding places of the definitely incriminated vectors, and the avoidance of all measures that are merely palliative or which aim at dealing in any locality with the anophelinæ in general, it follows that the command of such campaigns must, in future, rest with the chief entomologist and his staff; these experts will progressively regulate the attack against the vectors in accordance with the measures that are proved necessary, so minimising the expense and length of the campaign, and evading valueless or unnecessary effort.

Medical Societies.

MANCHESTER PATHOLOGICAL SOCIETY.

A MEETING of this Society was held on Dec. 12th, 1923, Dr. E. B. LEECH in the chair.

Dr. J. H. DIBLE opened a discussion on

Pneumococcal Infections,

and was followed by Dr. G. J. LANGLEY. These papers appear in the original columns of THE LANCET this week.

Mr. E. E. HUGHES, speaking of surgical infections, said that pneumococcal peritonitis was a disease of two varieties. The secondary variety affected persons of all ages and sexes, and was a sequence to some active pneumococcal infection in another organ. The primary variety was a disease of girls of about the ages of 2 and 11. This period corresponded to one of active development of the vagina, whilst the vaginal secretion had not yet developed its characteristic acid reaction, and suggested a vaginal infection as the route of entrance of the pneumococcus. The work of McCartney and Frazer had shown that this was the case. In pneumococcal peritonitis the lesions commenced in the pelvis, and the same type of pneumococcus had repeatedly been isolated from the vagina, peritoneum, and blood. Experimental work on rabbits and monkeys had confirmed this route of infection, whereas experimental blood infection was followed by septicæmia without peritonitis. The suggestion was that children at this age—and the disease occurred mainly in the poorer classes—became infected by sitting about upon doorsteps and pavements, and contracting direct infection of the vulva.

Prof. SHAW DUNN said that the conception of involvement of the lung, by spread outwards from the hilum, explained a number of points which had previously been obscure. He looked upon pneumonia very much as a cellulitis of the lung. It was difficult to understand why in some cases the same infecting

agent produced broncho-pneumonia and in others lobar pneumonia, and he was familiar with certain cases in which on post-mortem examination it was difficult to decide whether the condition was really to be designated lobar or broncho-pneumonia—a sharp line of division did not exist. He believed that the reason for such diversity of lesions was possibly a matter of magnitude of the infection: a single large dose might produce a lobar lesion, and a smaller one give rise to broncho-pneumonia.

Dr. A. H. HOLMES urged some objections against the idea of localisation of the early changes to the hilum. He thought that clinically the lesions were not found in that position in the early stages, and, further, that pleural friction was constantly an early sign and this would militate against such a localisation. He thought the disease might begin in the superficial part of the lung, and asked if cases were not met with at post-mortem where there was involvement of the outer portion of the lung and freedom of the root. He wondered if certain of the cases of peritoneal infection which were described as pneumococcal might not be in reality enterococcal infections.

Prof. MATTHEW STEWART said that he thought that the vaginal route of infection was an important one in streptococcal as well as in pneumococcal peritonitis, and quoted a case published by Adami bearing upon this point. With regard to the spread of the morbid process in the lung, he was familiar with cases of lobar pneumonia in which the whole lobe was consolidated except for its extreme edges, which might only show œdema and congestion, but not with the converse condition.

Dr. DIBLE, replying, said that he had never seen pneumonic consolidation of the lobar disease involving the periphery and sparing the centre. He doubted very much if auscultation and percussion would reveal deep-seated early changes in the lung root, and he thought that it was this localisation which was responsible for those cases of "central pneumonia" in which physical signs only appeared late. Early pleural friction was not a bar to the acceptance of the centrifugal spread of the disease as the distance of the pleura from the hilum was only a short one in the root region. He thought that the discussion had shown that the hæmatogenous theory of invasion had now been overthrown in two of the chief pneumonic infections. Bacteriologists realised, probably more acutely than others, from experimental experience, that the blood could usually look after itself in regard to most bacterial infections, and he believed that in the other chief pneumococcal infection—meningitis—the route of invasion was by the Eustachian tube or cribriform plate, and that here, too, the hæmatogenous theory would be shown to be incorrect. In considering the production of broncho-pneumonia he thought that Prof. Shaw Dunn's remarks had left little to be said save that bacterial virulence must also be taken into account, but this was a matter which at the present time was very difficult to assay.

Dr. LEECH thanked the speakers and concluded the discussion.

LIVERPOOL MEDICAL INSTITUTION.

A MEETING was held on Dec. 20th last, Prof. J. HILL ABRAM, the President, being in the chair.

Mr. JOHN T. MORRISON read a note on the

Treatment of Tuberculous Sinuses.

He pointed out the necessity for an efficient and at the same time labour-saving method in a condition of such chronicity and seriousness. He took for granted attention to general treatment along the most approved lines, and went on to speak of the operative treatment—radical operation in a minority of cases, in others removal of sequestra, scraping out a caseous gland, counter incision, and so on. In most, however, patient attention to daily dressing is all that is indicated. For this purpose he believed bipp carefully used to be most suitable. The technique involved strict asepsis. After passing a fine rubber tube to the limits of a carefully explored track, he aspirated pus and then washed out with spirit. Bipp suitably diluted with liquid paraffin was then injected so as to fill the track from the bottom up. The bipp should never be stiff enough to dam back discharge or so thin as to run out of a dependent opening. A dry dressing carefully secured in place may be left a week, ten days, or longer, and should not be touched until an indication arises. The need for re-dressing is enormously diminished and patients so treated, provided the whole of the diseased track is reached, do well, some healing rapidly. The treatment should not be used where active inflammatory trouble is present and only with caution in abdominal sinuses. Chest sinuses are suitable, however, even those with bronchial fistulæ. Cavities in the chest up to half an ounce capacity may be filled with bipp; the larger ones should merely have their walls coated with bipp sprayed on in ethereal solution. The bipp method of treating tuberculous sinuses was a useful addition to one's armamentarium under all circumstances, but when the surgeon was single-handed and skilled assistance inadequate it was invaluable to him.

Dr. NORMAN CAPON read a short paper on six cases of so-called

Hæmorrhagic Disease of the New-born.

He pointed out that examples of hæmophilia and of hæmorrhage secondary to conditions such as sepsis, syphilis, or enteritis should not be included in this category. After a brief description of his own cases, Dr. Capon drew attention to the various theories which have been advanced to explain the abnormalities of coagulation which appear to form the basis of the disease. It was probable that cases might be divided into two groups: one in which coagulation time is lengthened, with deficiency of prothrombin; the other with prolongation of bleeding-time, ascribed by various workers to deficiency of prothrombin, of blood-platelets, or of thrombokinase. The important clinical features were recorded and emphasis was laid on the efficacy of whole-blood administration. This remedy might be given by subcutaneous injection, or, in more severe cases, by intravenous transfusion, using either a superficial vein or the superior longitudinal sinus. The mother is generally selected as donor, and preliminary blood-grouping is then not necessary. Of Dr. Capon's cases five recovered and one died.

Dr. H. H. L. PATCH read a paper on

Dangers During the Administration of Anæsthetics.

Depression or failure of respiration and circulation due to the action of ether and chloroform in the various anæsthetic stages were discussed in detail, special mention being made of overdosage. The dangers of light chloroform anæsthesia were touched upon, with instances of too early a commencement of the operation causing reflex circulatory and respiratory failure. Commentary was made on the mental hyper-excitability produced by the hypodermic injection of atropine prior to the operation. It was held that the sphygmomanometer should be used in all serious cases, and that the accuracy in gauging the fall of blood pressure is a very important point both to the anæsthetist and to the surgeon. The usefulness of Hewett's airway was mentioned and the opinion expressed that with its use bronchitis is not found to follow an anæsthetic more frequently than without it. Dr. Patch held that bronchitis was due to irregular administration or previous disease. The latter part of his paper was devoted to difficulties and dangers found in anæsthetising patients suffering from fear and apprehension, from adenoids, in which condition he advocated ether, and from abdominal conditions. Conditions of spasm of the glottis and overdosage were considered, and finally the possibilities of diagnosing status lymphaticus before anæsthesia were discussed.

Dr. G. F. R. SMITH believed that the advantages of using a pre-operative dose of morphine out-balanced the disadvantages, and emphasised the danger of moving a patient suddenly.

Reviews and Notices of Books.

ANGINA PECTORIS.

By Sir JAMES MACKENZIE. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 253. 30s.

Sir James Mackenzie gives here a most readable account of angina, illustrated by a wealth of clinical material, and at the same time illustrates certain methods of investigation which he considers essential to the practice of medicine. The two most interesting sections are the preface and the tenth chapter, for in these he deals in a broad way with the whole question of health and disease. In a valuable appendix the records of 160 cases are given, including reports of a number of autopsies (22). Sir James Mackenzie differs from some in refusing to consider angina as a disease with a fixed and definite pathology. It is to him a symptom indicating exhaustion of the myocardium, and he correlates the pain of angina with that of renal colic, pointing out that the process by which the symptoms of renal colic are produced is comparable to that provoking angina pectoris. He has here applied his theory of disturbed reflexes in the production of symptoms to the special symptom-complex of angina pectoris. The classification of primary and secondary angina is accepted. In the former he includes those patients in whom changes of a permanent nature are present in the heart. In the secondary the chief deviation from the normal is an undue susceptibility of the nervous system, the result of some influence other than the heart. This classification obviously carries with it certain clear indications as to treatment and prognosis in any particular patient, and the chapter on treatment is a careful exposition of the author's views. While much can be done by skilful management of the patient, he emphasises the fact that in the primary anginas it is wise to recognise that the organic changes in the heart are permanent—as permanent as grey hair and the arcus senilis—and that treatment must be such as to prevent exhaustion of the enfeebled muscle. It is generally accepted that, though there is no constant pathological condition found in the hearts of those dying from angina, nevertheless some degree of coronary disease is a common finding. The significance of coronary disease is, that narrowing of the coronary artery results in a lessened blood-supply to the myocardium, and in the opinion of the author the pain of angina is associated with muscular contraction, as in the case of renal and other colic; and he considers that muscular contraction is a stimulus adequate to cause anginal pain when there is a deficient blood-supply to the heart muscle. Sir James Mackenzie also discusses the origin of anginal pain in those patients in whom no disease of the coronaries is present.

We have in this book a valuable contribution to the study of heart failure—the result of many years of investigation of cardiac failure and of the mechanism of pain.

GRAFTS FROM MONKEY TO MAN.

Quarante-trois greffes du singe à l'homme. By SERGE VORONOFF. Paris: Librairie Octave Doin. 1924. Pp. 251. Fr. 20.

IN this new book Dr. Serge Voronoff has given the results of further work on the subject of testicular grafts. The book contains some of the matter previously published in "Greffes Testiculaires" (1923), as well as entirely new material. Dr. Voronoff starts with a summary of the events that led to his adoption of testicular grafts as a treatment for testicular insufficiency, premature senility, neurasthenia, and debility. He describes how, in 1920, in an attempt to avoid the absorption that inevitably follows the placing of a graft from one of the lower animals in the human body, he employed a testicle derived from an anthropoid ape. For this method of using grafts from an allied species he has coined a new term referring to such grafts as homeografts, to distinguish them from autografts (grafts from the same subject), homografts (from the same species), and heterografts (from entirely different species). As a result of his animal experiments on the subject Voronoff has found that fragments of tissue taken from an allied species survive for a far longer period than a heterograft taken from a widely different species. In other words, a graft from a goat when implanted in a sheep survives for a longer period than a similar graft taken from a dog. The anthropoids being the most nearly allied to man, Voronoff considers them the ideal source of grafts for the human subject.

In one of his human cases Voronoff was enabled to examine a graft that had been taken from an ape some 15 months previously. The examination showed that not only had the epithelium of the seminiferous tubes survived, but that actual proliferation had occurred, so that in many places the lumen of the tubule had been obliterated. Of still greater interest is a similar observation made in the case of a goat that had been grafted with the testicles of a young animal that had not yet reached puberty. When the grafts were removed at the end of 14 months it was found that the epithelium of the graft had actually evoluted during the interval, so that the heads of spermatozoa could be made out, all signs of spermatogenesis having previously been absent. On these observations Voronoff rests his claims that homo- and homeografts not only survive, but may even develop after transplantation. His clinical results at any rate appear to show that the benefit of grafting may be maintained for a period of three and a half years. In one of his cases, however, the effect of the graft would seem to have waned towards the end of the third year, and at the request of the patient—a man of 65—the operation was repeated with results equally happy to those achieved on the first occasion.

The technique used by Voronoff is simple, and is described in great detail in the work under review. The cavity of the tunica vaginalis is always chosen where possible. Should there be insufficient room within the cavity for all the grafts, some of them are attached to the outer surface of the tunica vaginalis, and in order to encourage vascularisation the area of implantation is lightly scarified. The grafts are always placed so that the glandular surface is opposed to the tunica vaginalis, and care is taken that no two grafts come into contact with each other. Following the description of the operative technique are the records of 43 human cases subjected to grafting. In all cases monkeys or baboons were used as donors, only those monkeys being selected which gave clear evidence of having attained the age of puberty, since in certain cases in which younger animals had been employed no results were obtained. Amongst the later articles in the book are papers by the author in collaboration with Dr. E. Retterer on Heterografts and on the correlation between the physiological phenomena and the structure of testicular grafts. These papers are of particular interest and lend support to the view that is rapidly gaining ground that the interstitial cells are not responsible for the elaboration of the sex hormone. As an entirely new application of the principle of grafting, Voronoff has studied the influence of grafts on the healing of wounds. Carrel in 1912 published in New York a note on the artificial acceleration of the growth of connective tissue cultivated in vitro, and showed that the growth of the tissue of a chicken that had been cultivated in vitro could be stimulated by adding extract of embryo to the culture-medium. This suggested to Voronoff that the healing of wounds might also be stimulated by the use of emulsions of various glands such as thyroid, suprarenal, pancreas, and testicle. By bringing fragments of different tissue into contact with the wound he showed that whereas pancreas undoubtedly inhibited healing, thyroid and testicle hastened it. This accelerating action exerted by testicular tissue on a healing wound is evidently not due to any general stimulation of the body, but

to an action that is entirely local. The precise nature of this local action is still unknown.

It is difficult to pass judgment at the present time on Voronoff's new contribution to the subject of testicular grafts. Time and the results obtained by other researchers on this subject will show how far we can accept the views which he puts forward. The subject is one on which the attention of the medical profession has become focused, and others are working along the same lines. However, it may at once be admitted that Voronoff and Retterer have made valuable contributions to the subject in their study of the histology of grafts removed some months subsequent to their vascularisation. That mental suggestion plays a part in the benefits obtained from grafting is certain, but that this can entirely explain the results is extremely unlikely. The book should be read with interest by all.

The Medical Treatment of Disease.

Notes for Students and Young Practitioners of Medicine. Second edition. By Robert Dawson Rudolf, C.B.E., M.D. Edin., F.R.C.P., Professor of Therapeutics in the University of Toronto; Clinician, Toronto General Hospital; Consulting Physician, Victoria Hospital for Sick Children, Toronto. University of Toronto Press. 1923. Pp. 486. $4.

This is one of the most useful books dealing with treatment that have appeared during recent years. The reader who expects to find ready-made prescriptions for every condition will be disappointed, and here we feel that Prof. Rudolf has shown commendable discretion, for it is precisely those lists of prescriptions that form the danger of the majority of such text-books; they lead to carelessness and empiricism. In the present work the reader will find existing therapeutic methods and remedies briefly described, and usually with that critical outlook which marks the scientific observer. Such procedures as the production of artificial pneumothorax and duodenal alimentation are written of in sufficient detail to allow the practitioner to employ them without reference to larger text-books. We are interested to note that the author is lukewarm in his opinion of the surgical treatment of Graves's disease, and that he considers serum therapy of little use in the treatment of chronic bacillary dysentery. Several misprints, such as "construction" for "constriction" on p. 280, require correction, but are not sufficiently numerous seriously to affect the pleasure with which this book will be read.

Oral Hygiene.

By J. Sim Wallace, D.Sc., M.D., L.D.S., Lecturer on Preventive Dentistry, King's College Hospital. London: Baillière, Tindall and Cox. 1923. Pp. 76. 5s.

The teachings of Dr. Sim Wallace on the ætiology and prevention of dental caries are by now a familiar story and have become incorporated to a considerable extent in the current conceptions of dental disease, often without sufficient acknowledgment to their author. It is a disadvantage that there is no authoritative account of Sim Wallace's work within the pages of one book. At present his views are scattered through a series of volumes, with much overlapping and repetition, so that it is by no means easy to gather a comprehensive idea of the various aspects of his investigations. The present volume consists of three papers which have appeared elsewhere, reprinted apparently without alteration. The book is in no sense a text-book on oral hygiene as the title might suggest, though it contains much instructive matter on the subject. The papers have little continuity though they are concerned with the ætiology and prevention of dental caries. To those who have hitherto learned Sim Wallace's views at second hand we commend this book. If they will read the first and third chapters they will find there the essence of his teaching explained in admirably clear language. We do not think the short note on vitamins and hypoplasia can be regarded as a fair commentary on the vitamins and their relation to calcification. The chapter on the progress of preventive dentistry is an interesting historical review, but it is damaged by personalities out of place in a scientific book.

Handbook of Surgery.

By G. L. Chiene, M.B., C.M., F.R.C.S. Edin., Surgeon, Edinburgh Royal Infirmary. Edinburgh: E. and S. Livingstone. 1923. Pp. 592. 12s. 6d.

In his preface the author says that "this small handbook has been written with the object of providing a book for those who have not time to study the larger text-books." Many would hold the opinion that such students or practitioners are not worth catering for. The volume under review could certainly not be recommended as the sole text-book on surgery which the student should read. It is not possible in a book of this size to deal adequately with pathology, or to emphasise the principles upon which surgical treatment is based. Nevertheless, the teaching found in it is sound, as far as it goes, and, as a revision book, the student who has read the ordinary text-book may find it useful.

Ambulatory Treatment of Fractures and Diseased Joints.

By Carel A. Hoefftcke. With an Introduction by Frank Romer, M.R.C.S., L.R.C.P., and Articles by Many Eminent Surgeons and Physicians. London: William Heinemann (Medical Books), Ltd. 1923. Pp. 274. 17s. 6d.

This treatise is written to show the utility of the author's ambulatory extension splints, which have been applied for some 20 years in this country for diseases of the joints and fractures; and the value of the apparatus is proved by the fact that in medical literature, both in treatises and in journals, the merits of these splints have been recognised freely. Further, although Mr. Hoefftcke does not write as a medical man but as a skilled adjuvant to medicine, his treatise is prefaced by introductory communications from medical practitioners, styled eminent in the title, many of whom are justly well known. Mr. Frank Romer, in an introduction, states clearly that he has "recently had the opportunity of seeing patients with diseased joints who have been enabled to lead an active life using the affected joint freely by means of this (Hoefftcke splint) ingenious contrivance." And in our own columns Sir Arbuthnot Lane has written: "The advantages afforded by the forcible separation of the diseased articular surfaces from one another, combined with free movement, are best shown by the use of a really efficient extension apparatus for the leg which does not interfere with the functioning of the diseased joint"—the reference being to the same apparatus.

The principles involved in the construction of various forms of ambulatory apparatus devised by the author, as well as the methods of their application, are fully set out and clearly illustrated in the early chapters of the book, while an historical survey explains the steps by which valuable, and for the most part new, types of splint were arrived at. The main objects aimed at have been to take the weight of the body off the affected limb and produce extension between the articular surfaces in joint disease, while in fractures the intention is to keep the fragments in apposition and to prevent shortening of the limb. Mr. Hoefftcke produces manifold and mutually confirming examples of cases where these objects have been achieved without confining the patient to bed; and the general well-being which is produced by such patients being able to enjoy a natural environment cannot be exaggerated. It is not only that the more free circulation of blood to the site of injury promotes

local improvement, and this rapidly in many cases, but the system of the patient is more adequately strung up so that any improvements secured get full chance of development. In the book will be found numerous ingenious contrivances, fully figured and fully explained, which will assist the medical man to treat patients for numerous conditions from a patella wrench to a diseased hip-joint; while far the greater part of the contents consists of reprints from medical journals or of communications to the author written by practitioners and patients who have had good reason to be pleased with the application of his splints, or with the use of an ingenious extension table to be employed in the manipulation of diseased joints under anæsthesia. The majority of these tributes—which are, by the way, not systematically arranged—include photographs and radiograms of patients before and after treatment, thus conveying different messages of encouragement.

The book is very well written, but in future issues it might be well for the author to note that he has quoted the same words from a well-known surgeon on pages xi. and 84 and 129. All the tributes from the medical profession are not of equal value, but it would be captious to blame Mr. Hoefftcke for recording evidences of professional support which he has received. For throughout the book he writes as a skilled craftsman, leaving the medical profession to record their views of certain of his results. And it should be stated clearly that he works only with the medical profession, and not as one who offers a substitute for medical services.

PHARMACOLOGY AND THERAPEUTICS.

Handbook of Pharmacology, including Materia Medica. By BIRENDRA NATH GHOSH, F.R.F.P.S. Glasg., Examiner in Pharmacology, University of Calcutta. Calcutta: Hilton and Co. 1923. Pp. 396.

OUR text-books on pharmacology have improved in recent years, showing themselves, on the one hand, to be books of applied physiology, and on the other to be the parents of books on treatment. In fact, they have become more rational in their methods, and one result of this change is that it has become increasingly difficult to find a place in them for mere lists and types of preparations and for doses. These the student must know, even though they have to be learnt by heart. However much the examiner is pleased to find that a student has an intelligent idea of the action of mercury, he still rejects him if he gives a poisonous dose of the perchloride or if he cannot prescribe it in a practical manner. The books of writers like Poulsson and A. J. Clark, which centre round drug actions, are a great improvement on the older pharmacologies where the drug and not the action is paramount, but such books are not sufficient for the student. He wants something in addition. B. N. Ghosh's "Pharmacology," which seems really to be an abbreviated form of R. Ghosh's "Materia Medica and Therapeutics," affords the bare facts and lists which it is difficult to pick out in the other books named, a difficulty all the greater now it is customary to give preparations of the U.S.P. as well as of the B.P. This book cannot stand alone, as it does not make the student think, but it is useful as it supplies in assimilable form the concentrated facts which have to be learnt before a man can practise successfully or even safely.

Indian Therapeutics. By D. V. SANDU. Bombay: V. K. Sandu. 1923. Pp. 90 and Supplement.

SCHOOLS of treatment are out of fashion. None has shown itself to be absolutely right; few do not contain some glimmering of truth; all get left behind in the light of scientific research. But the Ayurved or Aryan medical science survives long, and this booklet, by one of the Sandu brothers, who have works for the manufacture of the drugs of this system, lays before English readers the history and merits of the system. The explanatory introduction is of interest, but to the uninitiated the list of drugs with long Indian names and of diseases treated is reminiscent of the herbalist or the quack. "The action of medicines mostly depends upon the belief of the patient in the prescriber and the medicine prescribed. Atmost (*sic*) care should therefore be taken to create confidence and hope in him." These are sentences which show candour, and their sentiment is one in which many English physicians will agree. But in all the material of Indian galenicals there must be something of value, and it remains for pharmacologists and perhaps for the Ayurvedic system to bring it to light. Interest is added to the book by the recent Madras report on native Indian schools, in which the Ayurved school is thoroughly considered.[1]

ECHOES.

By Sir DONALD MACALISTER, K.C.B. Glasgow: Maclehose, Jackson and Co. 1923. Pp. 212. 7*s.* 6*d.*

THIS volume is a reissue of the translations from and into various languages, which from time to time and in different places have appeared from Sir Donald MacAlister's pen. There can be few scholars with such a range of tongues, and not one alive whose learning and literary skill would enable him to translate not only Spanish, Italian, and Russian into English, and Greek and German into Russian, but Provence into Scots, Oliver Wendell Holmes and Robert Louis Stevenson into German, and quatrains of Omar Khayyám and songs of Walter Scott and Calverley into Welsh Rómani. Further, there are translations which are renderings, but not echoes; but Sir Donald MacAlister has well named this collection, for in those cases where the reviewer can apply any personal knowledge—a lamentably meagre range in proportion to the opportunity offered—both the spirit and the lilt of the original have been maintained. Let anyone, without knowing a word of gypsy language, read aloud the chorus of Kipling's "Smuggler's Song" in English, and then the version in Welsh Rómani, and appreciate Sir Donald MacAlister's skill and literary sympathy. He will also be sadly envious of the opportunities for enjoyment which learning has given to the President of the General Medical Council, whose serious business in life the New Year's list of honours celebrates this week.

HYGIENE OF THE VOICE.

By IRVING WILSON VOORHEES, M.S. Princetown, M.D. Columbia. New York: Macmillan Company. 1923. Pp. 212. 12*s.*

THIS little book is divided into two parts, the first intended for the general reader, teacher, or pupil, and written in non-technical language, and the second part intended for physicians or those possessing medical knowledge; but this latter part is not very technical, and is apparently intended for laymen with some medical knowledge quite as much as for physicians. The book is brightly and even humorously written, but is not quite dogmatic enough for the practical pupil; it advises him not to work the voice when he has a cold, but gives no decided opinion on such unsettled questions as the age at which teaching should begin or the use of the vocal registers. The author rightly advocates with enthusiasm a more cordial understanding between teachers of singing and laryngologists. The best chapter is that in the second part on the "tonsil question"; he sent out a questionnaire to 500 physicians and 500 teachers, and concludes that impairment of the voice after tonsillectomy is possible, but very rare; while most cases show an increased range of tone, he decides that abnormally large or diseased tonsils should be completely removed by dissection.

The author pays a high tribute to the work of Sir Morell Mackenzie.

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[1] THE LANCET, Sept. 29th, 659, 669.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

I.—ASSESSMENT FOR INCOME-TAX: ACCOUNT-KEEPING.

BY W. R. FAIRBROTHER, F.S.S.,
ACCOUNTANT AND INCOME-TAX SPECIALIST.

There was no reckoning made with them of the money which was delivered into their hand; for they dealt faithfully.—II. Kings xxii. 7.

THE completion of his annual taxation return is not a task the average medical man enters upon with gusto; rather does he feel that the ordeal, although not enjoyable, is yet inevitable. Doctors are not much given to a fondness for strict account-keeping, and in all too many cases the Income-tax return, whilst reflecting the receipts fairly accurately, does not as accurately allow for the expenses. The result, of course, is that a needless addition is made to the already heavy burden of taxation which must be borne. Moreover, apart from taxation, it is surely necessary that any professional man should know, at the end of the year, what his net profit amounts to. Not only does this enable him to gauge his financial position, but it affords the evidence of value of the practice required in the event of sale, death, or change of partners.

Having diagnosed the complaint it becomes necessary to prescribe the remedy, which is of a three-fold character—viz., a proper but simple form of account-keeping, the correct manner of computing the Income-tax assessment, and an explanation of the deductions, allowances, and reliefs which may be claimed.

The accounts may conveniently be divided into the correct recording of receipts and payments.

Receipts.—A Call-book or Diary will be kept giving sufficient details in the case of credit cases for a statement to be prepared later. This book would be in the form shown in Table I. It will be observed that one Cash column provides for cash paid at the time and the other for credit bookings. The Credit column must be posted in detail to a ledger, while the Cash

TABLE I.—CALL-BOOK OR DIARY.
January, 1923.

Day of week and month.	Name (and address if new patient).	Details of treatment, or drugs supplied.	Settled by ready cash.	"Bookings" not paid (post to ledger). Fol.	Amount.
Mon. 1	Allinson, R. H., Esq.	Massage—liniment, 3s. 6d.; ointment, 1s. ..		24	2 6
,,	White, Miss E. A.	Medicine as before	3		6
		C.B.1 ..	3		
Tues. 2	Brown, Miss B. (maid to Lady Morton; charge to her a/c).	Attended cut hand—bandage and ointment n/c.		7	3 6
Wed. 3	Wilson, Mrs.	Attended on round		82	5
,,	Thackery, Master.	Attended on round		84	5
,,	Thomas.	Attended on round	5		
,,	Smith.	Examination	1 1		
		C.B.1 ..	1 6		

("Bookings" column totalled through to end of year.)

TABLE II.—CASH BOOK.

Dr. CASH RECEIVED.

Date.	Name or details.	—	Cash.	Bank.	Ledger a/cs. Recd. Fol.	Amount.	Cash takings.	Insurance Commissioners.	Private cash introduced.	Interest received.
1923.										
Jan. 1	To Balances	b fwd.	3	350						
,, 1	,, Cash takings per	D/1	3				3			
,, 1	,, A/cs. recd.: Lloyd		3 3		34	3 3				
	Pullinger		10 6		5	10 6				
	Meredith		2 19 6		18	2 19 6				
,, 2	,, Cash takings per	D/1	1 6				1 6			
,, 3	,, do. do.	,,	10				10			
,, 3	,, A/cs. recd.: Allinson		12 6 6		24	12 6 6				
,, 5	,, Cash banked			30 8 6						
,, 5	,, Cheque for wages, &c.		10							
,, 5	,, Rent recd. (wife's property) ..		5						5	
,, 31	,, Insce. Commrs. (Nov.)		40					40		
,, 31	,, Banked			45						
			£ 88 8 6	425 8 6						
Apl. 1	To Balance	b/d.	2 9	289 13 4						
,, 1	,, Interest on deposit, per pass book ..			1 2 6						1 2 6
,, 15	,, Cheque repaid to bank	*		2						
		£	2 9	292 15 10						
	Analysis columns added through to totals at end of year ..					£	18 19 6	11 9	40	5	1 2 6
1924.										
Jan. 1	To Balances	b/d.	2 9	290 15 10						

column is totalled and entered daily on the receipt side of the cash book. No payments for *past* services are to be shown in the call-book, but such payments are entered at once on the receipt side of the cash book and posted to the appropriate ledger account. The cash book is as shown in Table II.

The receipt side of the cash book should have two cash columns, one headed Cash and the other Bank. Care should be taken that receipts are banked in full and cheques drawn for cash required for payments. When money is banked the Cash column should show clearly the details of the amount, which amount is entered in the Bank column. The Cash column will contain daily totals from the Call-book Cash column, amounts received from credit patients, local authorities, hospitals, Insurance Commissioners, &c. An analysis cash book is advocated in which columns are provided for the extension of the amounts received under the various heads given above, so that a yearly total can be obtained of the receipts from the different sources. Where the banking account is used for private as well as business purposes, dividends, rents, or other private receipts should be entered in the cash book (either in detail or without detail if it is desired not to disclose the detail in the business books) in order that the cash book can be balanced with the pass book. The Analysis columns on both sides of the cash book should be totalled continuously to the end of the year in order to give the figures for the final account.

Payments.—Cheque payments must be distinguished from cash payments by being entered in the Bank column side of the cash book, while cash payments are entered in the Cash column only. Cheques drawn for cash are entered in the Bank column on the payment side and in the Cash column on the receipt side. Both cheque and cash payments will be extended in the Analysis columns. Private payments or cheques to self for private purposes should be extended under the head of "Drawings." Care should be taken to distinguish between capital and expenditure payments. Additions to the previous stock of instruments should be distinguished from replacements, and additions to the consulting-room or surgery furniture from repairs and renewals. Sufficient detail of the payment should be entered—e.g., on entering a payment for gas the quarter year it relates to should be given. Petty expenses, such as postage and fares, may conveniently be dealt with by way of a petty cash book, the cash book being credited and the petty cash book debited with the round amounts allowed for petty cash.

The following is the procedure in case of a cheque being returned by the bank, and later repaid into the bank. On being returned by the bank, it should be entered as a payment in the Bank column and on

TABLE III.—FINAL ACCOUNT.

Year Ended 5th April, 1923.

RECEIPTS.		PAYMENTS.	
To Practice fees	400	By Rent	50
,, Insurance Commissioners	700	,, Rates and water	35
,, Asylum Board	50	,, Repairs	11
,, Wayward Corporation	500	,, Insurance	2
		,, Drugs, instruments and bottles	56
		,, Lighting and heating	20
		,, Postage, stationery, and telephone	33
		,, Periodicals and text-books	15
		,, Wages and N.H. insurance (including board)	55
		,, Car-running expenses (or hire)	80
		,, Locum tenens (including board)	50
		,, Accountancy	10
		,, Balance	1233
	£1650		£1650

TABLE II.—CASH BOOK (*continued*).

Date.	Name or details.	Voucher No.	CASH PAID. Cash.	Bank.	Drugs and instruments (small renewals only).	Rent, rates, taxes, and reps. to premises.	Gas and electric light.	Salaries.	Personal drawings.†	Capital expenditure.	Petty cash.	Sundries.
1923.												
Jan. 1	By Rent, Xmas qtr., less tax	1		14 2 6		14 2 6						
,, 4	,, Electric light do.	2		3 12 8			3 12 8					
,, 4	,, Gas do.	3		4			4					
,, 4	,, Burroughs, Wellcome	4		24	24					F.A.C.		
,, 4	,, Maw, Son, and Sons	5		50	30					20		
,, 5	,, Cash for wages, &c.	—		10								
,, 5	,, Wages: Chauffeur, &c.	—	3					3				
	Dispenser and boy	—	5 12 6					5 12 6				
	Carter Paterson a/c.	6	8 9		C.	8 9						18
	Fares	—	18									
	Petty cash	—	1								1	
,, 5	,, Cash banked	—	30 8 6									
,, 31	,, do.	—	45						30			
,, 31	,, Self			30								
Mar. 31	,, Balances	c/d	2	9 289 13 4								
			£88 8 6	425 8 6								
Apl. 13	By Cheque returned	*		2								
Dec. 31	,, Balances	c/d	2	9 290 15 10								
			£ 2	9 292 15 10								
					£54 8 9	14 2 6	7 12 8	8 12 6	30	20	1	18

C = Carriage. F.A.C. = First Aid Cabinet. † A column headed "Printing, Stationery, &c.," could be inserted next to "Personal Drawings."

being paid in again it should be entered on the receipt side of the cash book in the Bank column. It may be starred on both sides, as shown, to indicate that it need not be posted to the ledger. Cheque books and interest charged by the bank direct through the pass book should be entered in the Bank column on the payment side.

Final Accounts.—With a view to agreeing the final accounts for the year it is desirable that all casts and cross casts throughout the year should be checked from time to time. In preparing a total receipts and payments account for the year all additions to instruments, fixtures, &c., and all drawings must be excluded on the payment side, while on the receipt side private monies must also be excluded. The figures should also be agreed in total and for this purpose the starting bank and cash balances must be added to the receipts and the closing bank and cash balances to the payments. In order that a proper amount may be allowed for depreciation, it is desirable to have an inventory of the business fixtures, fittings, and instruments. The fire insurance inventory will often be a useful guide.

Audit.—Whether it is decided to have an audit or not it is well to have the receipts or vouchers in good order. This is easily effected by numbering the payments in the cash book consecutively. When the receipts come in they should be attached to the statement and numbered with a large number corresponding to the number in the cash book. It will be appreciated that No. 312 may come in before No. 305, but if every receipt is numbered clearly they can later be readily sorted into numerical order.

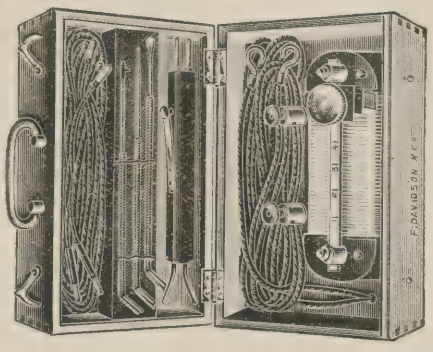
The final accounts could appear in the form shown in Table III.

In a succeeding article the Income-tax assessment, deductions, allowances, and reliefs will be explained, apart from the manner in which the accounts have been kept, so long as figures are ascertainable showing amount of profit.

New Inventions.

AN IMPROVED CAUTERY.

THE accompanying illustration shows an apparatus which has been designed for cautery work, and consists of a rheostat, handle, cords, terminals, and three heavy platinum burners. The source of electric



supply is the accumulator of a motor-car; the accumulator is, of course, continually charged by the dynamo. The cords attached to the rheostat are hooked to any accumulator from 4 to 12 volts. If more than one separate accumulator is fitted to a motor-car, one could be lifted out of its box after disconnecting and used with the outfit.

Mr. Davidson, of 29, Great Portland-street, W., has made the instrument for me.

CHARLES S. THOMSON, M.D., D.P.H.,
Medical Officer of Health, Deptford.

Reports and Analytical Records.

BICREOL BRAND BISMUTH CREAM.

(BURROUGHS WELLCOME AND CO., SNOW HILL BUILDINGS, LONDON, E.C. 1.)

THE employment of bismuth in venereal disease has been on trial for a number of years, and considerable experience has been put on record as to the influence exerted by trépol and neo-trépol upon syphilitic symptoms. In Bicreol Messrs. Burroughs and Wellcome supply the medical profession with a cream which consists of pure metallic bismuth in an extremely fine state of subdivision incorporated in a creocamph basis, each c.cm. containing 0·15 g. of the active element. Considerable interest is to-day focused upon bismuth as an anti-syphilitic agent, the metal having been reported successful in cases which had previously resisted mercury and arsenic, the attendant disadvantages being comparatively slight. In the English edition of Prof. Poulsson's Pharmacology, edited by Prof. W. E. Dixon, only a mild form of stomatitis is alluded to as a possible inconvenience.

FIVE NEW PREPARATIONS.

(1) IODO-BISMUTHATE OF QUININE (FRAISSE). (2) SÉRUM NÉVROSTHENIQUE (FRAISSE). (3) SÉRUM FERRUGINEUX (FRAISSE). (4) NATIVELLE'S TABLETS QUINIDINE SULPHATE. (5) SIROP FAMEL.

(MESSRS. WILCOX, JOZEAU AND CO., 15, GREAT ST. ANDREW-STREET, W.C. 2.)

WE have received from this well-known firm of foreign chemists specimens of five of the latest preparations which they have placed on the market, the first three being from the laboratories of M. Marius Fraisse and Co., 8, Rue Jasmin, Paris, the fourth from the Laboratoire Nativelle, 49, Boulevard de Port Royal, Paris, and the last from the laboratory of M. P. Famel, 20 and 22, Rue des Orteaux, Paris. (1) Quinine-iodo-bismuthate ampoules (Fraisse). These spirillicide ampoules, which are supplied with the proper syringe where required, and with full instructions as to dosage and administration, would enable a systematic course of the drug to be taken with safety. Each ampoule contains quinine-iodo-bismuthate, 3 gr. to 4 c.cm. of olive oil. (2) Sérum Névrosthenique ampoules (Fraisse). This preparation is a combination of strychnine and phosphorus for employment in neurotic conditions, under the prescription of a medical practitioner. Each ampoule contains 0·0005 g. strychnine cacodylate and 0·1 g. sodium glycophosphate per cubic centimetre of liquid, so that an adult may receive daily an injection of 1 c.cm.—that is to say, the contents of an ampoule. (3) Ferrugineux ampoules (Fraisse). The formula of these ampoules, which have been designed for the intensive treatment of anæmia, is as follows: Cacodylate of iron, 0·01 (1/6 gr.); cacodylate of strychnine, 0·0005 g. (1/120 gr.); and sodium glycero-phosphate, 0·1 g. (1½ gr.). The method of employment recommended is 1 ampoule daily for ten days to a fortnight, an interval of five or six days being allowed to elapse if it is necessary to recommence the treatment. (4) Quinidine sulphate tablets (Nativelle). These tablets are supplied under the name of quinicardine, in sealed tubes, at the price of 6 francs each tube, containing 20 tablets, all care having been exercised to render the drug absolutely pure. (5) Sirop Famel. This is a well-known remedy for giving relief to patients suffering from bronchial irritation and catarrhal respiratory conditions. It would appeal to medical men as a more valuable remedy if the claim set out with it were not so all-embracing, but there is considerable clinical experience in France to the effect that the sirop is a well-tolerated preparation of creosote. The creosote in the sirop is associated with codeine and aconite, so that the preparation ought not to be taken without medical advice or in doses larger than those indicated in the directions.

THE LANCET.

LONDON: SATURDAY, JANUARY 5, 1924.

SIR DONALD MacALISTER.

WE are speaking for the whole of the medical profession in offering warm congratulations to Sir DONALD MACALISTER, President of the General Medical Council, upon the honour of a baronetcy which he received this New Year's day. In the case of so well-known a man there is no need to detail the events of a career which from boyhood at Aberdeen, through Cambridge, Oxford, London, and Glasgow, has been marked by the highest academic prizes attainable. Balliol scholar at Oxford, and Senior Wrangler at Cambridge, President of the General Medical Council and of the Gypsy Lore Society; finished scholar in half a dozen modern languages; first Croonian Professor of the Royal College of Physicians of London and Principal of the University of Glasgow—such are sufficient indications of the wide range over which Sir DONALD MACALISTER has been able, in a life of extraordinary intellectual fullness, to use his mind aptly and his judgment wisely, shrewdly, and impartially.

In this place we refer only to Sir DONALD MACALISTER'S work as President of the General Medical Council, regarding his labours here as the outstanding achievement of his career. He became President of the Council in 1904 in succession to Sir WILLIAM TURNER, having previously been a Member of the body for five years as the representative of the University of Cambridge. At his election as President there were many members of the Council of far longer standing, some of whom were at that time more widely known in the purely medical world; but in the Council MACALISTER had made his mark from the beginning, especially by resolute watchfulness over the educational curriculum as conducted by various of the statutory bodies. His motions in respect to the irregularity of the conduct of examinations at the Apothecaries' Hall, Dublin, to the low standard of the early tests at the Society of Apothecaries of London, and to the impractical character of the final tests at the University of Oxford led to his appointment to represent the Council at a conference with the Board of Education, as well as to a general stiffening of the procedure at the visitation by the Council of the various examining centres. Further he became Chairman of the Pharmacopœia Committee, and thus along two of the main divisions of the work of the Council revealed himself as a leader, a reformer, and a reasonable man. So when he was elected President of the Council there was satisfaction within the body, and this was widely reflected among medical men without, who had reason to feel that the Council required, in view of increasing educational and social developments, a man equipped to deal firmly with large things, while equally able to see that in details the course taken must be correct.

These expectations have been fulfilled, and a review of the extended work done by the Council during Sir DONALD MACALISTER'S long period of authority would prove this entirely, as would any synopsis of his individual share in the proceedings. Throughout his whole term of office the Council has steadily increased in public esteem and in public utility; foolish bickerings and personalities have ceased; the finances, once sorely depleted by the needless protraction of the sessions, have been placed on a sure footing; subcommittees, wisely chosen, have rendered reports in advance on all the main headings of the work, with the result that the discussions by the main body have been coherent and well-directed. The voice of the Council, where medicine is concerned in the conduct of public affairs, is now received with respect in the transaction of national business, while the good men whom the President has led during the past 18 years would be prompt to allow that their virtues have had full opportunity under his guidance.

BACTERIAL FOOD CONTAMINATION.

A SYSTEM which depends on a sequence of slow extensions and developments instead of on the sudden application of a thought-out and comprehensive code is liable to present surprising lacunæ. Such a system we see in our laws and enactments relating to public health, and one of the most obvious of the lacunæ is in regard to the protection of certain of our food-supplies from bacterial pollution. In some directions the safeguards are very efficient, in others they are inadequate or non-existent. Dr. C. E. GODDARD [1] has recently drawn attention to the dangers of bacterial contamination from the sale of bread delivered without wrappers, of fruit—grapes, dates, and others—without any protection, while the numerous articles in grocers' shops which attract flies and which are not protected from them form other risks, the same being said of the fingering of meat in butchers' shops. As medical officer of health for the Wembley area, which includes the British Empire Exhibition 1924, Dr. GODDARD will be brought in contact with food problems of great importance. While many such sources of food pollution might be cited it is perhaps easy to exaggerate their significance in respect of public health. They form serious defects in our methods of food distribution, but of considerably greater importance is the absence of adequate control over the preparation and of subsequent care in respect of what may be called "prepared meat foods" and the lack of supervision over those who handle foods destined for consumption by the public.

A study of outbreaks of food poisoning shows that a material proportion, indeed, a majority, of such outbreaks are due to specific contamination of made-up meat foods—sausages, brawn, meat pies, and the like. There is, however, no special supervision authorised in any of our public health laws either for the premises where these are prepared or for the care of these products. The clauses in the different Acts dealing generally with food allow for inspection and seizure of foodstuffs found unfit for consumption, but such regulations do not go far enough, and there is nothing to prevent preparation under manifestly unsatisfactory conditions. These comestibles need *special* supervision and this they do not receive. It is not uncommon for such made-up foods to be prepared in or immediately adjacent to the slaughter-house and for the workers in the latter to take part in the preparation of the foods. At the City of Liverpool special powers have been obtained to control the premises

[1] Journal of State Medicine, December, 1923, xxxi., 585.

we are considering, but such enlightened authorities are very few in number. It is not the large scale manufacturers for whom such supervision is required, for here nearly all concerned are alive, if only for the preservation of their own good name, to the importance of cleanliness. The risk mainly operates for the small businesses carried on by two or three people, ramifying often into several branches concerned in slaughtering, in food preparing, and in sale over the counter. These businesses are inadequately controlled, and it is here that an immunity from accident fosters a disregard for dangers of which lack of education as to food contamination precludes any grasp.

The importance of supervision over those who handle food destined for consumption in public places is better recognised in the United States than in this country, and in New York, Kansas City,[2] and other places which might be enumerated, special examinations of these "food handlers," as they are called, are undertaken and special ordinances are promulgated for their supervision and control. The considerable number of such persons found to be suffering from syphilis, tuberculosis, and other communicable diseases is disquieting, and at the same time furnishes abundant justification for such examinations. The Health Commissioner of Kansas is endeavouring to institute a mental test for food handlers which will necessitate study of elementary sanitary principles. In this country but little has been attempted along these lines. Quite recently the case of a man suffering from advanced tuberculosis while continuing to deliver milk and otherwise take part in the duties of a purveyor of milk aroused some comment in the public press. It was not at all an isolated case and the authorities are in no way authorised to stop such a practice—as far as Acts of Parliament go they are powerless.

With such a series of ways in which disease can be conveyed by contaminated food it is desirable and important to seek for guiding principles as to the lines which should be followed if adequate protection is to be ensured. Two such principles are indicated by the facts of the situation. In the first place, with our elaborate system of public health officials the public have a right to assume that those who minister to their wants in public places where food is supplied are healthy or, at least, not likely to contaminate with harmful bacteria the food they serve. In the next place available scientific knowledge shows that it is imperative that all made-up foods which are composed of substances which favour bacterial growth should be adequately controlled and supervised so that these dangers may be minimised. This is especially necessary when such food is sold cooked and is therefore eaten without the safeguard of additional cooking. These goods are nutrient media for bacteria and the importance of the fact that there is no subsequent cooking is frequently lost sight of or unappreciated. Comparing bread and brawn, both receive no subsequent cooking, but with bread the risk of disease conveyance owing to the food being unwrapped is comparatively slight though the dirtiness implied is revolting. But with such a substance as brawn bacterial contamination is a danger because of the facility for bacterial multiplication after chance contamination and before consumption. A better protection of all food articles exposed to sale is desirable, as Dr. GODDARD wisely points out, and the prime needs are for control over those who handle food supplied in public places to be eaten without further cooking and in particular an extension of the present inadequate control over all places where made-up foods are prepared which are suitable bacterial media and which are eaten without further cooking.

[2] See THE LANCET, 1922, ii., 679, and 1923, i., 778.

CHOOSING A PROFESSION.

WE have never far to look for an example of a square peg in a round hole—a fellow-being who has missed his vocation in life. The war jerked many square pegs out of round holes, and sometimes found square holes for these pegs, but the process was seldom more than a blind shuffle. Some, perhaps many, of the misfits we see about us could have been avoided had the persons concerned had the benefit of expert medical advice at the outset of their careers. Without it, they have remained in their ill-adjustment, striving against it, what time their friends have hammered hopefully on the square peg, trusting that it would become round or that the hole would become square in the process. A very remarkable book[1] has been published by the oculist Prof. H. LAUBER, who has chosen as his collaborators 11 eminent specialists with wide experience of the misfits in life in their various specialties. Prof. LAUBER had hoped to induce the Austrian Ministry of Health to take up this work, but the fact that it has had to be carried out as an independent undertaking may have added to, rather than detracted from, its usefulness. From time to time the daily papers contain correspondence with the heading: "What Shall We Do with Our Boys?" But it has seldom been suggested that, before an answer to this question is attempted, a boy should be given a searching examination of body and mind by a medical expert or, better still, several medical experts. There is something ironical in the fact that at the present time medical examinations for certain services, such as the army and navy, are, at any rate partly, intended for the rejection of unsuitable applicants. Might not medical examinations of our fellow-beings on the threshold of life fulfil a higher purpose if their chief aim was to find out the qualifications, rather than the disqualifications, of the individual for a certain vocation or profession? Merely to pick out the "A-ones" for certain duties and to leave the remainder to fend for themselves is assuredly a policy as short-sighted as it is callous. This policy may, perhaps, appeal to a certain class of employer, but with the progress of civilisation we are learning to think in terms of the employees.

As an oculist, Prof. LAUBER has had exceptional opportunities for observing the tragedies which an unwise choice of profession brings in its wake, and he refers to the case of a cavalry officer whose high degree of hypermetropic astigmatism greatly impaired his efficiency. As a prospective cadet he had been rejected on account of his eyesight, but his father, who had influence in high quarters, got his son into the cavalry through a back door. There he was a square peg in a round hole, with no one but himself and his father to thank for his unhappy fate. Even this extreme example can be paralleled in this country and not seldom, while less obvious unsuitability for the selected career strikes the eye daily. But in the advice as to the choice of a profession the medical examiner must look far ahead; a candidate may be qualified to fill a post satisfactorily at the present, but will he be equally qualified a decade or two hence, when it is too late to change

[1] Handbuch der ärztlichen Berufsberatung. Edited by Prof. H. Lauber. Vienna: Urban and Schwarzenberg. 1923. Pp. 586. Swiss francs 18.75.

to another profession? A waiter with progressive myopia may for some time be able to carry out his duties satisfactorily without glasses—somebody else can make the pun for us—but when the time comes that spectacles are indispensable he must cease, it appears, to be a waiter. We are assuming that a waiter may never, or almost never, wear glasses, because a waiter so reinforced is as rare as, say, a High Church clergyman with a moustache. A generation ago the family doctor was often called on to advise in the choice of a profession for the son of the house, and the advice given was often sound. But with the development of the school medical service it is the school medical officer, rather than the family doctor, who will play the most important part in this matter as far as the working classes are concerned; and Prof. LAUBER anticipates the time when the school medical service will be so organised that the scholar when he leaves school will have his qualifications and disqualifications carefully analysed and classified. It is not, of course, Prof. LAUBER'S intention to rob the parents or their children of their freedom of choice; what he proposes to supply them with are scientific data on which they can base their choice of a profession.

In a chapter on Character Defects in the Young, one of Prof. LAUBER'S collaborators, Dr. ERWIN LAZAR, draws attention to the special qualifications of the hyperthymic[2] person whose bright and cheerful temperament is most suited to busy surroundings and free intercourse with strangers. The hyperthymic individual is suitable for employment in public-houses, the barber's shop, and trade generally. But he is not suitable for occupations requiring conscientious and persistent effort, nor is he fit to work alone and not under observation. The antithesis to this type is the depressive, intolerant, morose person who does not love companionship, preferring his own company. To give him the occupation suitable for a hyperthymic person is to court disaster, whereas he is comparatively well qualified to work independently and alone. Several of Prof. LAUBER'S collaborators have tabulated their information for ready reference, lists being given of various occupations and the qualifications and disqualifications therefor. Lists are also published of the disqualifications and defects most likely to give trouble in certain occupations, and to give an illustration of the thoroughness with which this work is done we would refer to a table in which Prof. GUSTAV ALEXANDER classifies the occupations unsuitable for anyone with abnormal labyrinthine functions. About 50 occupations are mentioned, and not only the acrobat and aviator, but also the chauffeur, house decorator, and jockey are mentioned in this list. The qualifications and disqualifications of a doctor are discussed by more than one of Prof. LAUBER'S collaborators, and conditions regarded as disqualifications for the practice of medicine include chronic catarrh of the respiratory passages, perforation of the septum of the nose, ozæna, psoriasis of the nails, eczema, syphilis, idiosyncrasy to mercury, degenerative defects, psychoses, and much else. History is full of records of successes achieved by square pegs in round holes, and we need only cite the case of NELSON, who was always sea-sick in rough weather, to stress the fact that apparently serious obstacles to success in a profession may be overcome. But these are exceptions proving the rule, and we should do well to fit our offspring into the mosaic of life with even greater care than we fit a piece of painted wood into a jig-saw puzzle.

[2] From θῡμός the principle of life, not θύμος the gland.

RESEARCH AND THE PRIVATE PATIENT.

IN a book dealing with the metabolism of diabetic patients[1] E. P. JOSLIN pays tribute to the great assistance he has received from the patients themselves in the course of his investigations. "The patients considered themselves united in a partnership, having for its object the accumulation of knowledge for the benefit of all diabetics rather than for the given individual under investigation in particular," he writes, and this happy experience has been shared by many whose work has brought them in touch with the modern treatment of diabetes. Its gravity and the importance of meticulous attention to details of dietary make this disease peculiar in that the close coöperation of the patient is essential for successful treatment; but the benefit to medical science which results from such coöperation might, we feel, be extended by a much wider application of such coöperation in the case of sufferers from many serious diseases. The last century saw a tremendous growth of medical knowledge resulting, on the clinical side, from the careful observation of large numbers of cases. Our knowledge of the clinical aspects of nephritis, as an example, is largely the result of the generous action of the colleagues of RICHARD BRIGHT, who placed a whole ward at his disposal to enable him to make close study of this malady. To-day, both on the clinical and the laboratory side, there is need of more detailed study of individual cases, sometimes over very long periods.

It is here that the private patient may be of such special utility. Physicians and surgeons attached to the great general hospitals are constantly confronted with the difficulty of tracing the end-results of treatment; the most elaborate "follow-up" systems fail to trace an appreciable percentage of cases; the illiteracy, the indifference, and often the stupidity of that floating population which is treated in these institutions are a formidable bar to progress. Private patients, on the other hand, can usually be traced with ease; they are accessible over long periods, and their superior education renders them much readier to supply that information which is often of vital importance in a clinical inquiry. We have heard it urged that the confidential relations between a physician and his patient prohibit the publication of data accumulated in the course of his private practice. For such a view we can find no logical support. Clearly no doctor has the right to disclose the identity of his patient in any written account of a case, and the difficulty here is far greater with private than with public patients, but the duty is imposed just as strongly in the case of hospital patients as in that of those seen in private. But provided that this first rule of conduct be observed it remains the duty of the medical man to advance knowledge, and the publication of careful clinical and laboratory observations remains the most important road for such advance.

A further benefit accruing from coöperation with the patient is the educative effect of such combination. A large part of the public remains in deep ignorance of the importance of research, and the veil of this ignorance is most surely lifted by personal experience of the methods and aims of our profession. Knowledge of the purport of laboratory investigations gives the patient an entirely new sympathy towards such work, and the laboratory worker who is able to investigate an intelligent patient over a long period is in a position to obtain results of far greater utility than is the case when a single observation is all that is permitted to him.

[1] E. P. Joslin: Diabetic Metabolism with High and Low Diets. The Carnegie Institution, Washington, 1923.

Annotations.

"Ne quid nimis."

THE NEW YEAR HONOURS.

THE list of New Year honours, although short, includes the names of 14 members of the medical profession. Sir Donald MacAlister becomes a baronet. Among those upon whom knighthood is conferred are Dr. Henry William Russell Bencraft, of Southampton, well-known alike as a sound practitioner, now retired, as a sportsman, and politician; Dr. Byrom Bramwell, a great physician and teacher, recently honoured by his colleagues and friends on the occasion of his seventy-fifth birthday; and Dr. Harry George Waters, P.M.O. of the East Indian Railway. Dr. Henry Lindo Ferguson, Dean of the Faculty of Medicine, Otago University, Dr. David James Galloway, member of the executive and legislative councils of the Straits Settlements, and Lieut.-Colonel William Thomas Prout, one of the medical advisers to the Colonial Office, also become knight bachelors. In the Military Division of the Order of the Bath Lieut.-General Sir William Boog Leishman, K.C.M.G., Director-General of the Army Medical Service, becomes a knight, and Major-General Dennis Joseph Collins, C.M.G., Deputy Director-General in the Southern Command of the East Indies, and Air-Commander David Munro, C.I.E., of the Royal Air Force Medical Services, Companions of the same Order. In the Royal Victorian Order Surgeon Lieut.-Colonel Sir Warren Crooke-Lawless, C.B., C.I.E., C.B.E., is made a knight, and Dr. Alexander Hendry, Surgeon Apothecary to H.M. Household at Balmoral, is promoted from M.V.O. to C.V.O. Dr. Behari Lal Dhingra, Chief Minister of the Jind State, Punjab, receives a Companionship of the Indian Empire, and Dr. Louisa Helena Hart, medical missionary at Madanapalle, Madras, receives the Kaisar-i-Hind Medal. To all these we offer in the name of the medical profession our hearty congratulations.

A FRENCH MEDICAL COUNCIL.

THE note by our correspondent in Paris, which appeared on p. 1318 of our issue of Dec. 15th, 1923, in regard to a proposed Medical Council in France, is of much interest. It suggests the establishment in France of what at first sight might seem to be a body analogous to our own General Medical Council, but this would be a wrong idea of what is so far projected, in spite of certain similarities of design and function. It appears that local councils are to be established for dealing with conduct in a professional respect. These appear to resemble in some degree the committees of inquiry set up under the Insurance Acts in this country to deal with offences under those Acts. This will no doubt be of considerable help in checking abuses, but there is always a risk with local tribunals that personal factors may not be eliminated, and that the judicial aspect may be to some extent overlooked. It is understood, however, that in addition to this there is to be a National Medical Council sitting in Paris, of whom half are to be legal members and half members of the medical profession, with the President of the Academy of Medicine as president and member ex-officio. To this body appeals from the local tribunals can be made, and a safeguard is therefore provided against any local prejudice. The details of the working of this Council are not set forth in the note, and there is nothing to show whether there is power to summon witnesses, or to take evidence on oath. The right of appeal is set down as being in regard to charges of incompetence, exceeding of duty, or violation of the law. The first and last of these are not matters which would come before the General Medical Council of the United Kingdom. The first is a matter with which it never deals, leaving persons who feel themselves aggrieved to take what action they think well in the civil courts. The term "exceeding of duty" is not very clear, and it is difficult to say what is meant by it. Violation of the law in this country would be dealt with in the first instance by the civil courts, but the General Medical Council has the duty laid upon it of considering convictions and judging whether the gravity of the offence is such as to warrant the erasure of a name from the Register or not. There does not appear to be any provision for either the local council or the National Council to deal with offences which in this country come under the heading "infamous conduct in a professional respect," and include offences for which no civil remedy is provided. In view of the long experience of the General Medical Council and the large number of recorded judgments which appear in its publications the authorities in France might do worse than to consult the Council, and, if necessary, to ask for its observations before any new law on this subject is finally settled.

THE CONTROL OF ALCOHOL.

Dr. Arthur Shadwell has long been known as a leading student of the drink problem and more especially of the possibilities of keeping its evils within bounds by legislative measures. His writings on the subject are remarkable—one is almost tempted to say unique—because he seems really to occupy that detached and impartial position which every brewer and equally every teetotal fanatic claims as his own. He has just published a volume,[1] written originally as one of the war monographs to be issued by the Carnegie Fund for International Peace, which gives a detailed history of the controls which gradually restricted the facilities for getting drink during the war and of their partial relaxation since 1919; in an appendix of 82 pages are printed a selection of the orders and regulations which were made and a variety of statistics. The effect of these various measures cannot, of course, be stated in such objective terms, but the author has no hesitation in affirming his conviction that the police returns give in a general way a satisfactory gauge of alcoholic excess, especially where, as in the present instance, the fluctuations are so large. Whether the scale is the consumption of alcohol (which is at one end of the series of possible measures) or convictions for drunkenness (which is the other end of the series), there is no doubt that the imposition of control was followed by less drinking, and that drinking became progressively less as control was made more stringent. The consumption of beer in 1914, 1918, and 1922 was as 100, 38, and 65, of spirits as 100, 28, and 54; the convictions for drunkenness as 100, 16, and 42.

There is much of interest in the details of the statistics—the seasonal and local changes and so on—but most readers will probably prefer to treat them in the broad way which the author encourages and turn to the chapter in which he summarises the results which he deduces. These are four in number: (1) While engineering, shipping, and other vast industries had to be dealt with because they were *useful* for the conduct of the war, alcohol was the one thing which had to be dealt with because it *interfered with* the conduct of the war. Drinking was found to be a serious national disability and remains so. (2) It is possible effectively to check excessive drinking by legislative control which leaves an amount of liberty sufficient to prevent substantial resistance or evasion. (3) The chief measures in producing this result were shortening of hours, limitation of supply, diminution of strength, and raised prices. (4) It is possible under peace conditions to keep the volume of intemperance far below its old level by means of shorter hours and higher taxation. And as corollaries we may particularly notice three points which Dr. Shadwell insists on. Control will reduce consumption only to a

[1] Drink in 1914–1922: A Lesson in Control. By Arthur Shadwell. London: Longmans, Green and Co. 1923. Pp. 245. 10*s*. 6*d*.

certain point: if it is pushed too far or too fast those who are controlled will rebel, as they did in Sweden in 1918. And the sheet-anchors of control are short hours and high cost. These have proved really efficacious, while State ownership, reduction in public-houses, improvement of premises, disinterested management, and similar devices have failed to exert any perceptible influence on sobriety and public order. This last conclusion will distress those who believe that the quantity of alcohol drunk is of less moment than where one drinks it, and that a man will probably drink less in pleasant and humane surroundings than in a gin-palace. Popular opinion on the reformed public-house is apt to be misled by its manifest advantages for those who do not want alcohol. Those who imagine that the standard of the tea-room is reproduced in the bar should study the author's full account of the Carlisle experiment; whatever other benefits it conferred on the inhabitants, it is difficult to see any evidence that it reduced intemperance to a greater degree than did the restrictive measures which prevailed in the controlled areas generally. Finally, Dr. Shadwell flatly denies that the reduction of drunkenness which obtains at present is due to any general tendency towards sobriety—to that change of heart on the subject which has to some people been the most hopeful sign of permanent and lasting improvement. He admits that such a tendency exists, but thinks that its action is very slow and perceptible only over a long period of years.

The book deserves, and will, we hope, receive, the careful attention of everyone who is concerned in framing temperance legislation. Short cuts might be simpler in the end. It is possible that Benjamin Kidd might have been able to convince Dr. Shadwell that a will to power can make social evolution travel at an extraordinary pace. But the author's plea to drop polemics and give common-sense and coöperation a trial is one which by its sheer reasonableness must receive respect. And he shows plainly that much may be achieved by such characteristically national methods.

KÜMMELL'S DISEASE.

IN a paper read before the Section on Orthopædic Surgery at the seventy-fourth annual session of the American Medical Association, Dr. Fosdyk Jones,[1] of Denver, who reported an illustrative case, stated that the post-traumatic spondylitis described by Hermann Kümmell (Hamburg) in 1895 is a rare but distinct clinical entity caused by direct or indirect injury to the vertebral column. Kümmell described the following three distinct stages in the condition: (1) The stage of initial injury to the spinal column attended with a varying degree of surgical shock, (2) the stage of relative comfort in which the patient is able to carry on his occupation, and (3) the stage in which after several weeks or months, or even two or three years, an angular kyphosis develops with recurrence of pain, which is either localised over the spine or radiates over the extremities. Fracture does not always result from the injury, but in some instances severe contusions of the spongiosa are sufficient to damage the bony framework and cause slow and gradual collapse of the spinal segments. X ray examination, in which both antero-posterior and lateral views are essential, may not show any obvious lesions in the early stage, whereas after months or one or two years the collapse of the vertebral bodies and compression of the intervertebral discs is plainly seen. The diagnosis must be made from Pott's disease, spinal neuroses, contusions, ankylosing spondylitis, back strains, and railway spine. The prognosis as a rule is favourable if early treatment is instituted. The deformity can be controlled by a suitable immobilising apparatus or closely fitting plaster-of-Paris jacket, and fibrous or bony ankylosis can be obtained which will give an excellent functional result. In the more severe types, especially neglected cases, a radical ankylosing operation, such as that described by Hibbs or Albee, is indicated. Dr. Fosdyk Jones's case, which occurred in a boy aged 5, is of special interest in that though the disease may follow injury at any age, it is rarely seen in children, and this was the youngest patient on record in whom it had been observed. The condition occurred as the result of a fall, directly after which the boy remained unconscious for five or ten minutes and then complained of severe pain in the back and thighs. He was kept in bed for two days and then allowed up. A week after the injury a swelling was seen over the lumbar region, but disappeared in a few days after the use of hot compresses. Two months after the accident he complained of severe pain in the back radiating to the thighs, and movements of the spine, especially in a forward direction, were very painful. An angular deformity in the region of the lower lumbar vertebræ was then noticed. There was no paralysis. A clinical diagnosis of Kümmell's disease was confirmed by X ray examination, which showed a compression fracture of the fourth lumbar segment with thinning and compression of the intervertebral discs. A plaster-of-Paris jacket was applied and the pain disappeared. As no increase in the kyphosis took place, an ankylosing spinal operation was not considered necessary.

[1] Journal of the American Medical Association, Dec. 1, 1923.

THE RELATION OF MALARIA TO ALTITUDE.

THE relative rarity of malaria in elevated regions in the tropics has been recognised since the very earliest times, but up to the present no precise observations seem to have been made on the influence of altitude upon malaria. S. R. Christophers has stated that the highest point above sea-level at which indigenous malaria exists is Quito, a town situated on the Equator at a height of 9000 feet, but possessing an even and warm climate. Malaria is prevalent sometimes at 5000 feet in the Himalayas, and at still higher levels, up to 7000 feet, in Southern India. In Italy indigenous malaria is said to occur at an altitude of 8500 feet. The consideration of these facts has led Lieut.-Colonel C. A. Gill, I.M.S., to make more exact observations in the Punjab, and his results are published in the *Indian Journal of Medical Research* for October, 1923. A spleen-rate of 80 per cent. is found at an elevation of 1000 feet, and at the foot of the Himalayas from 2000–4000 feet endemic malaria is very severe. The infection appears to be constant, and this region is not liable to experience the great epidemics which periodically decimate the people of the plains. From 4000–5000 feet endemic malaria appears to be less prevalent and relatively milder in character. The highest elevation in the Himalayas in which indigenous malaria has so far been found is at a height of 5000–6000 feet, while at the hill-stations, which lie from 6000–8000 feet, such as Simla, Kasauli, and Murree, malaria is entirely absent. Epidemiological observations made at the last-named station show that ten species of anopheles, six of which are known to be capable of transmitting malaria in other parts of India, are prevalent. The absence of malaria cannot therefore be ascribed to the paucity of suitable mosquitoes, nor to any deficiency of carriers of the malaria parasite, as 80 per cent. of the summer population, who are temporary residents in this hill-station, come from the endemic centres of the disease.

Climatic factors necessarily play a part. The mean temperature is markedly lower throughout the year as compared with that of the plains. The daily temperature shows a mean range of 10–20° F., the maximum never rising above 80°, while the minimum may fall at certain times of the year to below 40°. Should the minimum temperature at which the anopheles parasite is capable of developing be taken at 61° F., it will be seen that the atmospheric conditions in Murree are suitable for the spread of this disease for at least five months in the year, and hence the absence of indigenous malaria cannot be attributed to any adverse influence exercised by temperature during this period. The experience of the author in other parts of the world

has led him to believe that the humidity of the atmosphere is the chief factor in determining the development of the parasite within the mosquito, and the most striking feature exhibited by the meteorological chart of Murree is the dryness of the atmosphere throughout the greater part of the year. The relative humidity is greatest during the coldest months, and in May it is only 41 per cent. Should the mean relative temperature at which this development can take place be estimated at 63 per cent., it follows that the potential infection period is reduced in this instance to one of eight weeks. To test this point still further, experiments on the transmission of malaria were undertaken with the local anopheles, especially *A. willmori*, and it was found that development takes place when the temperature remained constant—at about 68° F.—with a relative humidity between 79 and 94 per cent.—that is, under the atmospheric conditions which prevailed in Murree during the months of July and August. The absence of malaria in these hill-stations must therefore be ascribed to the very short period during which the infection may be acquired, and this, at the most, does not exist two months.

METABOLISM OF SKI SPORT.

FROM time immemorial the Scandinavian peoples have used skis (Icel. *scidh*, a piece of wood) to prevent them from sinking in the snow on their journeys in the long Northern winter. Ski-ing as a sport is about 60 years old in Norway, whence it was introduced into Switzerland about the year 1900. The last ten years have seen an enormous development of ski-running as a form of winter amusement, and it has now become the object of serious study by physiologists. Prof. A. Loewy has recently published in the *Schweiz. med. Wochenschrift* the results of a study undertaken by him to ascertain whether the sensation of ease experienced by the ski-er necessarily involves a diminished output of energy, and whether ski-ing is superior to walking from an economic point of view, as Liljestrand and Stenström had previously found to be the case with skating and L. Zuntz with cycling. An unskilled ski-runner obviously expends a great deal of unnecessary energy in various balancing and other movements of the body, whereas the movements of an expert are not only fewer in number but are also easier and freer, giving the impression that less energy is needed to cover a given distance with skis than without them.

To verify this impression an estimation of the gaseous exchange is essential. The only observations on the subject hitherto published are some notes by Liljestrand, whose experiments, even though made under specially favourable conditions rarely realised, showed a higher value both for CO_2 output and for oxygen consumption. Prof. Loewy's idea was to ascertain the exchange taking place under "natural"—i.e., ordinary—conditions both with and without skis, on firm and on soft snow, on level and on rough ground. The subjects of the experiments were healthy schoolboys of from 13 to 17 years of age, all of whom were expert ski-ers. The apparatus used was that devised by Zuntz, with which the volume of inspired air could be read off, and the expired air collected and subsequently analysed. A table is given showing for each of the nine individuals tested the volume of air breathed, the CO_2 output, the oxygen consumption, and the percentage of oxygen increase with and without skis on level ground and on a slope. The figures give a good idea of the influence which the condition of the ground exercises on the breathing, but the most important point brought out is that in every case the volume of air breathed is enormously increased—up to 47 per cent.—with the use of skis. Similarly, while the oxygen consumption is much increased when walking on snow without skis as compared with walking on firm snow-free roads—17·3 c.cm. as compared with 13·5 c.cm.—yet with the use of skis it rises still more markedly, the figures in this particular series reaching a minimum of 20·6 and a maximum of 31·8 c.cm. In answer to the possible objection that the height of Davos (1500 m.), where the experiments took place, might have some bearing on these results, Prof. Loewy points out that all the subjects of the experiment were living at this altitude, and were therefore well acclimatised.

It is thus quite clear that from the point of view of expenditure of energy ski-ing offers no advantage over walking; and although in ski-ing on level ground there appears to be invariably an associated sensation of ease and lightness, Prof. Loewy has conclusively demonstrated that this subjective sensation bears no relation to the actual output of energy required, the apparently easier movement involving a considerably greater consumption of energy. The value of ski-ing, however, lies mainly in the greater speed attainable by its means, and in the possibility of moving with comparative safety over ground that would otherwise be dangerous, both these advantages amply justifying the popularity of the sport.

THE OFFICIAL CONTROL OF DISPENSING.

IN a circular (No. 462) just issued under the Sale of Food and Drugs Acts the Minister of Health draws the attention of local sanitary authorities to certain suggestions which he has received from the Society of Public Analysts with regard to the sampling of prescribed medicines. These are to the effect:

(i.) That the inspector be instructed, prior to dividing the sample into three parts, to mark, in the presence of the vendor, the height the contents reach in the bottle in which the medicine is originally supplied to him by the vendor. That the bottle so marked be submitted to the analyst in order to enable him to determine the total quantity of medicine supplied.

(ii.) That the analyst and the medical officer of health be both consulted as to the type of prescription it is desirable to use for the purpose of checking the accuracy of dispensing, and that, in the event of any substantial inaccuracies being disclosed by analysis, both these officers be consulted as to the desirability of instituting proceedings.

The object of the first suggestion is to enable the analyst to ascertain the total quantity of each of the ingredients (including the water or other "vehicle") present in the medicine. If he receives only a portion of the sample, representing an unknown fraction of the whole, he is only able to ascertain the relative percentages of the several ingredients; but if he is also provided with information as to the total quantity of the medicine dispensed he can then deduce the total amount of each of the ingredients as supplied by the chemist. These particulars will obviously be of importance to the authority in considering what action it should take in regard to a medicine which has been inaccurately dispensed. The second suggestion is in accordance with the practice already largely adopted by local authorities. It is clearly desirable that, where a sample of medicine is taken for the purpose of checking the accuracy of dispensing, it should be so chosen as to be capable of accurate analysis. It is also desirable in considering whether or not proceedings should be taken under the Sale of Food and Drugs Acts that proper regard should be paid both to the degree of accuracy obtainable in the analysis of the article in question and to the margin of error allowable in ordinary dispensing operations.

THE DIAGNOSIS UNIT ON ACTIVE SERVICE.

IN the *Journal* of the Royal Army Medical Corps for December, 1923, Dr. Philip Manson-Bahr concludes his useful contribution on Laboratory Diagnosis in the Tropics and Sub-Tropics in War Time. In this paper he calls attention to the value of diagnosis units consisting of one medical officer, two special orderlies, and two drivers. Such units have the advantage of extreme mobility; two of them, in fact, moved to Damascus in 1918 with the cavalry. They are self-contained, possess their own transport, and are able to perform essential work at a rapid rate. During the summer of 1918 six units in Palestine examined more than 40,000 slides of blood for malarial parasites,

discovering a percentage of subtertian infection which varied at the different stations from 2 to 16 and which showed a dramatic rise in the month of October. Malaria simulates other diseases so closely as to be almost undiagnosable without the help of a laboratory; at one of these diagnosis units it was found that 11 out of 15 cases segregated as dysentery and 30 out of 45 cases diagnosed as influenza were really due to subtertian malaria. For the purpose of training the personnel to deal with the diagnoses of malaria and dysentery, 7 officers and 16 orderlies attended a course, lasting six weeks, held some distance behind the line. Within this time it was possible to render the officers, and in most cases the men as well, familiar with the appearance of normal blood cells and the various stages of the malarial parasite, although, of course, the actual diagnosis was made in each case by the officer in charge. The advantage of mobile horse-drawn diagnosis units of the kind described by Dr. Manson-Bahr is apparent from his article and should certainly be borne in mind in any future campaigns. By means of such rapid diagnosis the mechanism of evacuation is accelerated, the work of the field laboratories alleviated, and the routine of the casualty clearing station lightened.

MEDICAL BIOMETRY.

Prof. Raymond Pearl in his "Introduction to Medical Biometry and Statistics,"[1] has attempted to write an introduction to the practice of statistics which shall appeal to the medical reader having no preliminary mathematical knowledge and no primary interest in mathematical lines of thought. With this end in view, mathematical investigations are almost wholly excluded from the volume, the fundamental concepts being developed on experimental lines; an excellent example of this is the chapter on correlation, where the passage from no correlation to perfect correlation is exhibited by a series of experiments. In the first chapter, the author, having dealt with preliminary definitions, lays down the following propositions:—

1. That there is no inherent reason why medicine in every one of its phases should not ultimately become in respect of its methods an *exact* science, in the same sense that physics, chemistry, or astronomy are to-day exact sciences. 2. That this goal will be reached in exact ratio to the extent to which quantitative methods of thought and action are made an integral part of the training in every sort of medicine. 3. That no number or figure can be said to have any final scientific validity or meaning until we know its probable error, the "probable error" being the measure of the extent to which the number will vary in its value as the result of chance alone.

Prof. Pearl gives an historical sketch of the pioneer work done by Graunt, Süssmilch, Quetelet, and Farr. In speaking of the latter, he makes full use of Dr. M. Greenwood's article published in our columns[2] in 1921, which he characterises as "the best existing brief estimate of the significance of Farr in the history of medicine." Following chapters describe the raw data and methods of presentation. The author's account of the Hollerith system will be found very helpful since few private students have the opportunity of seeing or using the machines. Prof. Pearl passes to an exposition of rates and ratios and a short account of life-tables. In speaking of short methods of life-table construction, reference might have been made to Part II. of the Supplement to the 75th Annual Report of the Registrar-General, which describes the method of Dr. E. C. Snow, much the best available. Prof. Pearl next discusses the concept of "probable error" and related notions of probability. In Chapter XIII., the measurement of variation is studied; in the next two, correlation; the work concludes with a short account of simple curve fitting. It will be seen that the book covers much ground, and, in our judgement, its author has successfully accomplished his task. It is natural and right that in his choice of examples, Prof. Pearl should have had the needs of American students chiefly in mind, but this fact will not prevent English public health students from profiting fully by a study of the book. Since, under the new regulations of the General Medical Council, a less superficial acquaintance with the elements of vital statistics is demanded of candidates for the D.P.H. than before, the book should enjoy a wide circulation; we know of no other likely to be equally useful to the medical student. The literary style is agreeable and the expression of opinion on disputed points temperate, with the possible exception of a footnote on p. 224, where the animadversions upon Mr. J. M. Keynes's treatise might have been expressed more courteously. We gather from the preface that Prof. Pearl has in mind to publish a sequel to this book; should it be as well written as the present volume, advanced students will incur the debt of gratitude which this book imposes upon beginners.

[1] London: W. B. Saunders Company. 1923. Pp. 379. 25s.
[2] Medical Statistics, THE LANCET, 1921, i., 985.

RECOVERY BRANCHES OF HOSPITALS.

IN reporting last week the meeting of King Edward's Hospital Fund for London, brief mention was made of the report of a committee on the "recovery branches" of London hospitals. This report was presented by the chairman of the Hospital Economy Committee, Mr. Leonard L. Cohen, who remarked that the apparent cheapness resulting from the low cost per bed at the branch was largely illusory. Four of the large London hospitals have branches wholly or largely devoted to recovery work as distinct from convalescent work. These are the Elizabeth Garrett Anderson Hospital for Women (at Barnet), the London Hospital (at Reigate and now also at Mitcham), the Royal Northern Hospital (at Southgate), and St. George's Hospital (at Wimbledon, partly recovery and partly convalescent). There is no doubt that convalescent patients benefit by the better air and the comparative quietude of their surroundings at these recovery hospitals; there is the further advantage that the number of cases passed through the parent hospital can be thereby increased. It was also thought at one time that the average cost at the branch would be much lower than at the hospital, but in respect of this financial saving the advantage appears to have been exaggerated, and any hospital which established a recovery branch on the strength of this argument might find itself involved in unexpected financial liability. The resemblances between the recovery branch and any other addition to the bed accommodation of a hospital are far greater than the differences. The addition of a recovery branch, moreover, concentrates in the parent hospital a larger number of patients who need expensive methods of diagnosis and treatment, thus enabling fuller use to be made of a highly specialised staff and apparatus. The wider adoption of the system should properly be regarded as a form of hospital extension, the additional beds merely being at a distance instead of on the hospital site. It is in fact an economical and efficient method of extension.

THE COMMON COLD.

"THE amount of absenteeism in large business and industrial establishments due to minor illnesses is seldom appreciated until the facts are thoroughly reviewed." This is the opening sentence in a recent Statistical Bulletin of the Metropolitan Life Insurance Company of New York (Vol. IV., No. 11), where an analysis is made of the loss of time due to the "common cold" among 6700 clerical employees at the company's central office. During the year ending July 28th, 1923, no fewer than 2824 common colds, involving disability for work, were reported to the company's medical staff, infection occurring at a rate of 421 per 1000 employees for the year. We are not told what degree of streaming nose determined the disability for work or whether the risk of infecting others counts more in New York than it does here as an excuse for absence. The average number of days of disability per person on the pay-roll for the year was 0·9, and

the average number of days off work per case 2·2. On the whole in this one office 6233 days were lost in the year from common colds, among which, be it noted, were generously included acute bronchitis and tracheitis. Two periods of maximum incidence were observed, the first following the advent of cool weather in the late summer and early autumn, the second during the following January or February when the coldest weather of winter prevails. This twofold prevalence suggested the occurrence of two types of catarrhal fever, possibly interrelated in some way. From a careful study of the figures it appears that in New York there is a close relation between the number of common colds and the rise and fall of the weekly mean temperature, a drop of 10° F. carrying with it an increase of 18 colds per week in this group of 6700 people. A chart reproduced in the Bulletin shows graphically the inverse ratio of colds and temperature. On the other hand, relative humidity and total precipitation seemed to have little or no influence on the incidence. The Bulletin suggests that the annual downward swing of temperature can be compensated for by proper attention to clothing, to ventilation, and to the heating of homes, work-places, and means of transportation. We need not conclude, and, indeed, the Bulletin does not imply, that the fall of temperature in itself is responsible for the infections—it may just as well be the indoor habit of life to which the drop of temperature gives rise; and it remains to be seen whether the evil would be substantially mitigated by keeping the insurance clerk all day long, at work and at play, in a uniform temperature. Experience does not suggest that those who pay most attention to warming their aura secure thereby much immunity in comparison with their less protected associates. The relationship between the two groups of minor infections is being further studied. We are glad to learn that the U.S. Public Health Service is inaugurating a study of common colds over a prolonged period. It is remarkable what little definite knowledge there is regarding the epidemiology of these mis-called minor ailments, which are the bane of civilised life and a constant menace to the prestige of medicine.

A SORDID STORY.[1]

THE publication of the story of a trial that has excited considerable emotion of an unwholesome kind in the public mind, within about 12 months from its conclusion, is open to the criticism that the time which has elapsed is too short for dispassionate and therefore impartial examination of the evidence to be possible. This latest volume of the excellent Notable Trials Series has been edited by a journalist of ability, who has not confined himself in his introduction, as some of the lawyers who have treated other criminal trials for the same publishers have done, to a judicial setting forth and summary of the facts and circumstances of the case. He prefers to criticise judge, counsel, and conclusions of the jury, mainly in order to convince us that Edith Thompson was wrongly convicted. He condemns, for example, Sir Henry Curtis Bennett, a not inexperienced advocate, for having "lost one of the opportunities of his life-time when, after the confused and uncertain opening of the Solicitor-General," he did not keep Mrs. Thompson out of the witness-box, and leave the prosecution to fulfil their admitted obligation to prove the case against her. He condemns equally the very unemotional judge who tried the case, for references to Bywaters as "the adulterer," asserting that adultery is to young people of the present day "merely a quaint ecclesiastical term for what seems to them the great romantic adventure of their lives." Mr. Young appears to us hardly to appreciate the position of a jury, who had to consider whether Mrs. Thompson, in fact, suggested and instigated the murder of her husband, which she did nothing to prevent when it took place, rather than whether she was determined, when she wrote her notorious letters, that Bywaters should stab Thompson, or believed him to be capable of doing so. However, whatever her mental reservations may have been, neither her condemnation, nor his, laid any heavy responsibility on the medical witnesses called by the prosecution. Dr. P. J. Drought, who described the wounds on the murdered man, was quite clear that the fatal wound was due to the last blow inflicted, and was of the opinion, but not positively so, that the blow was struck from behind; and his evidence, on the whole, was not inconsistent with the story which was told by Bywaters, and which was not believed by the jury, in description of how the struggle began. Mr. J. Webster and Sir Bernard Spilsbury, if they did not prove that Mrs. Thompson had never administered poison or powdered glass to her husband in order to kill him, stated that no traces of any such attempts to murder remained in the organs submitted to them. The medical and scientific evidence in the case was neither vital nor challenged, and it is not necessary to recapitulate here the history of a crime and a trial still fresh in the memory of those interested. We regret the way in which a sordid story has been presented.

[1] Trial of Frederick Bywaters and Edith Thompson. Edited by Filson Young. Notable Trials Series. London and Edinburgh: William Hodge and Co. 1923. Pp. 293. 10s. 6d.

THE VENEREAL DISEASE SOCIETIES: A FUSION OF WORK.

THE eighth annual report of the National Council for Combating Venereal Diseases has just been issued and covers the year ending June, 1923. While the Council has to regret a pecuniary stringency which has been common to all voluntary associations in these times of financial stress—a stringency which has compelled them both to cut down their personnel and move to smaller offices—the latest report shows that activity in propaganda has in no way been abated. The outstanding feature of the year has been a wide and also intensive dealing with venereal problems internationally, which culminated in the institution of the Union Internationale for the study of the subject, and the last report of the National Council deals fully with the objects of this new union. There is also issued with the report a précis of the important meeting held in November last at which the fusion of the National Council for Combating Venereal Diseases with the Society for the Prevention of Venereal Disease came into definite form, with the result that the British voice in international affairs will now have the advantage of unanimity in principle. It will be remembered that at a previous conference of the two bodies the following resolution had been approved:

> Subject to the approval of their respective executives this conference resolves itself into a deputation to the Ministry of Health to urge that the law should be altered so as to permit properly qualified chemists to sell ad hoc disinfectants, provided such disinfectants are sold in a form approved and with instructions for use approved by some competent authority.

It was then seen that the main obstacle to concord was about to disappear, and at a meeting last November of the National Council it was announced that both bodies had accepted the report of a committee of inquiry on the matters at issue, so that the new chairman of the National Council, Lord Trevethin, was able to state that the damage to both organisations in the eyes of the general public, due to their dissensions, would no longer be felt.

In respect of the international movement, Mrs. Neville-Rolfe, the general secretary of the National Council, attended a conference at Paris, when it was agreed that a union should be formed of all the national organisations engaged in the work of combating venereal diseases. The immediate work before this union is stated under the following headings: Rendering non-infective the maritime and colonial services; surveillance of emigration; surveillance and concerted action along the frontiers; international measures for the suppression of quackery; a single moral standard for both sexes; and to study

generally the principles of legal responsibility, compulsory notification and treatment, and penalties. There is, then, every chance that some of the gross causes of the dissemination of disease will disappear, while the voice that should be heard with particular respect, as coming from the main maritime power of the world, will lose none of its emphasis from detailed differences of opinion among honest workers.

THE WORSHIPFUL COMPANY OF PLUMBERS.

Dr. F. J. Waldo, recently Master of the Worshipful Company of Plumbers, has re-issued his little history of the Company, which makes interesting and informing reading. This history dates back through many centuries and shows how a craft guild, by tenacious effort, can maintain its organisations in the face of many vicissitudes. The Charter of James I. brings us definitely into a modern sphere of thought, for it stated that it was granted for the utility, advantage, and relief of the good and honest, and for the terror and correction of the evil, deceitful, and dishonest. The ordinances of the Company from the reign of Edward III. up to this charter are set out, together with a description of the arms of the Company, in the following phraseology of Elizabethan heraldry :—

"And whereas the most ancient and necessarye Seyence of Pluming dothe no lesse deserve to be remunerated then any other mysterye or Arte whatsoever, I the sayde Clarencieulx King of Armes by power and aucthority of my office, granted unto mee by Letters Pattent under the Broade Seale of Englande have geven graunted assigned and allowed and by their putes doo gyve graunte assigne and allow unto the sayde Companye of Plumers and theire succesors forever this theire Armes and Creast following: Vialt or on a Cheveron Sable towe soodring irons in saultor with a cutting knyfe and a shaver argent; in Cheife between two sounding leades proper, a Jacobs staffe of the seconde, and in poynt a water levell of the same. And for theire Creast upon a Heaulme on a wreath or and sable a ffountayne argent garnished on the toppe with an Archangel holding a sworde and a Ballance or with this their ancient worde or device Justicia et Pax."

As is well known, a system of voluntary registration of plumbers was inaugurated by the Company of Plumbers 40 years ago at the time of the International Health Exhibition. The Company is not wealthy, as may be gathered from the fact that its chief source of income has been derived from the sale of its hall, and it is reasonable to think that the time may have come when the registration of plumbers should cease to be voluntary and those who desire to become plumbers should pay a definite fee of registration after showing that a certain standard of proficiency has been reached. A high standard of plumbers' workmanship is necessary for the carrying on of the business of this life, as the Charter of James I. indicates, and all the public is interested in is being able to distinguish a man of competence and training from the father of Joseph Vance, and in promoting a proper system of technical education for those responsible for domestic sanitation.

THE CASE OF INSURANCE PRACTICE.

AT the Court of Inquiry into the insurance capitation fee, whose first sitting is to-day, Friday, Jan. 4th, the case presented on behalf of the insurance practitioners by the Insurance Acts Committee of the British Medical Association will run on lines which all familiar with the question have confidently anticipated. And as the arguments are sound we would not have them altered. Medical men working under the National Health Insurance Acts cannot, and do not, expect to escape the effects of financial stringency, but the medical profession has already given evidence of its willingness to make sacrifices, while the conditions of panel practice are so arduous that unless remuneration is adequate the quality of the service must be rendered less secure. The well-known places in which the services of insurance practitioners can be differentiated from the work of private practice are again set forth with great clearness and in proper perspective.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LII.

THE PALLIATIVE TREATMENT OF TOOTHACHE.

IT often happens that an individual afflicted with toothache seeks the aid of a doctor because that of a dentist is not available. Successful relief of the pain requires a knowledge of the pathology of dental disease. Toothache or odontalgia is due to two causes: inflammation of the pulp (commonly, though erroneously, called the nerve), or pulpitis, and inflammation of the dental periosteum or periodontitis. A correct diagnosis is essential, for the treatment of the pain arising from these conditions is different.

Due to Two Causes.

Pulpitis usually arises as a sequel to dental caries, though it may follow occasionally from other causes, such as fracture of a tooth. The pulp is a delicate and complex structure containing an abundance of nerve fibres and blood-vessels, which enters the tooth by a narrow opening at the end of the root. The cavity in which the pulp lies, being formed of dentine, is rigid. Thus in hyperæmia of the pulp the dilatation of the vessels occurs at the expense of other elements of the pulp, and is most marked at the constricted entrance. This serves to explain the severe pain of pulpitis and the reason why suppuration and gangrene so commonly occur; the delicate nature of the pulp and the anatomical factors allow of only a limited power of repair. The pain is sharp and shooting; it tends to occur in acute paroxysms which may suddenly cease, and is usually worse at meal-times, for food gets jammed into the cavity and increases the tension. Thermal changes affect the pain. Sometimes cold will relieve it in the early stages by constricting the blood-vessels; later both heat and cold intensify it. Chemical stimuli (sweet and acid substances) may increase the pain, possibly by altering the osmotic tension in the pulp. The pain is usually more severe when the patient lies down. If the pulp is actually exposed at any point, pressure on this exposed area causes excruciating pain. Even cotton-wool pressed lightly in the cavity causes suffering out of proportion to the pressure used. In the later stages, when suppuration has commenced, the pain becomes worse and throbs; it may not be localised in the tooth which is the cause, but may be referred to any other tooth on the same side, even from a lower molar to an upper. In such a case a painful stimulus applied to the lower tooth may cause an immediate exacerbation of pain referred to the upper. The pain may be referred to other areas supplied by the fifth nerve, and, in addition, there may be associated areas of hyperæsthesia of the skin of the face, which have been mapped out by H. Head.

Periodontitis.—The periodontal membrane is both a supporting and nutritive structure. Its fibres are attached to the root and to the bone of the socket; thus it is the means of attaching the teeth to the jaw. The membrane is well supplied with blood-vessels and nerves. Although the periodontal membrane is frequently infected via the gum margin, as in pyorrhœa, the inflammation rarely gives rise to pain, for the pocket formed by the progressive ulceration from the surface allows of drainage and prevents tension. When the periodontal membrane is infected via the pulp canal following gangrene of the pulp, pain is common. A normal tooth is capable of slight movement in all directions through stretching of the fibres of the periodontal membrane. This buffer-like action of the membrane lessens the impact of mastication. In periodontitis the engorgement of the vessels causes the tooth to rise slightly in its socket, the

first symptom being a slight persistent soreness, which is increased when the teeth meet. The tooth feels longer than its neighbours; indeed, it *is* longer, and thus the whole force of mastication falls on the inflamed tooth. At this stage gradual pressure on the tooth may bring relief by emptying the vessels, though a sudden impact is painful. As the inflammation increases and the tissues become filled with exudate, the tooth rises higher in its socket and becomes perceptibly loose. The pain assumes a dull, boring character, and the slightest pressure on the tooth increases it. Thermal changes do not affect the tooth, nor does pressure in the cavity increase the pain, except through pressure transmitted to the membrane. The gum over the root becomes red and tender. When suppuration occurs the pain assumes a persistent throbbing nature, worse at night, until the pus makes its way through the periosteum of the bone, when the tension is lessened and the appearance of a swelling, usually in the sulcus between the gum and cheek, is often followed by a striking diminution of the pain.

Differential Diagnosis.

This should not be difficult, though in pulpitis the localisation of the tooth involved may not be easy. A few dental instruments, such as a mouth mirror, two or three dental probes, a pair of dental conveying forceps with curved ends, and a couple of excavators will be found useful. The history of the pain is important in differential diagnosis. Pain during eating, or when taking hot or cold fluids, or sweet substances, points to pulpitis. Paroxysmal pain is certainly due to an inflamed pulp. Dull and constant pain, unaffected by heat and cold, but made worse by pressure on the tooth, suggests periodontitis. In an obviously carious tooth superficial débris should be removed with an excavator. A probe should be used cautiously, lest the exposed pulp should be touched. Thermal tests should be applied: warmth by heating the handle end of a metal instrument, and placing the hot instrument on the dried crown. As for cold, if cotton-wool sprayed with ethyl chloride is exposed to a current of air it will freeze, and may then be applied to the tooth. Periodontitis is easily diagnosed by tapping the teeth with a metal instrument; this will at once reveal any tenderness. There is often an associated periodontitis in acute pulpitis, but it is slight and should not lead to confusion. Periodontitis tends to spread by continuity, so that more than one tooth may be tender, but the chief culprit will be looser and more tender than its neighbours. Digital exploration of the inner and outer gum side may reveal a tender or swollen area. Pain due to periodontitis is more localised than that caused by pulpitis, and referred pain is less common. The absence of a cavity in a suspected tooth should not preclude the diagnosis of periodontitis, for the pulp may have died as the result of a fall or blow. Such teeth are usually discoloured.

Treatment of Pulpitis.

If there is a large accessible cavity, the superficial débris should be removed with an excavator, the cavity should be dried, and a small pledget of wool dipped in pure phenol or oil of cloves is placed therein. A convenient preparation of phenol is carbolised resin. This consists of pure carbolic acid, 4 parts; resin, 4 parts; and chloroform, 3 parts. The mixture forms a viscid fluid. A small piece of wool should be dipped in this and placed in the tooth, and should be protected from the saliva by a watertight dressing. The use of gutta-percha is not advisable, except by an expert, for it must be used hot and packed in under pressure, and may thus increase the pain instead of relieving it. A convenient dressing is wool dipped in gum-mastic or gum-sandarac. This sets hard enough to last several days. In addition, the gum should be painted with tincture of iodine to aid in depleting the vessels of the pulp. Equal parts of the weak and strong tinctures of iodine form the best preparation. Counter-irritation is only an adjuvant in the treatment of pulpitis. Success cannot be guaranteed, but providing the inflammation has not gone on to the stage of suppuration and that the right tooth has been treated, the pain will in many cases be relieved for a few days. If these measures fail anodyne drugs may give relief; tr. gelsemium, 10-minim doses, may be combined with pot. brom., 10 gr. But drug treatment represents a less desirable and less certain means of relieving pain.

Treatment of Periodontitis.

In these cases the pulp is dead, and it is useless, and indeed harmful, to place a dressing in the cavity of the tooth. Any possibility of drainage through the pulp canal would thereby be made impossible. A piece of wool placed in the cavity during meal-times, and removed afterwards, is useful in preventing food from being jammed in the pulp canal. The only possible treatment is counter-irritation applied to the gum. Tincture of iodine, to which some tincture of aconite has been added, is the best drug. The gum should be dried and the excess of iodine squeezed out of the wool before applying. Penetration of the drug is increased if a current of warm air is directed on the gum. The strong tincture may be used, but should not be applied more than once. In subacute periodontitis counter-irritation is often efficacious, unless suppuration has supervened. A hot mouth-wash should be used frequently, the heat being more important than the ingredients, though weak carbolic is perhaps the best. A smart saline purge may help in the early stages. In severe periodontitis extraction is often the best treatment. Since such teeth are loose and their extraction may not be difficult, the medical practitioner need have the less hesitation in attempting their removal. A local anæsthetic should never be used in acute periodontitis, for the injection of fluid into the inflamed gum may result in severe after-pain and even necrosis.

L. E. Toney records[1] a case in which severe toothache was relieved by cocainisation of the sphenopalatine ganglion. A drop of saturated aqueous solution of cocaine was applied to the mucous membrane just posterior to the posterior tip of the middle turbinate bone. The pain ceased in five minutes. In obstinate cases of toothache, which cannot be relieved by other ways, this method might be worth a trial.

Treatment of After-Pain following Extraction.

The aid of the medical practitioner may be sought to relieve the pain following extraction of a tooth. If there has been laceration of the gum or splintering of bone the pain may be severe. The best way to relieve it is by irrigation of the socket. A syringe with a narrow nozzle and of about an ounce capacity should be used. The best lotion is carbolic, 1 in 100, as hot as the patient can tolerate. The socket should be gently flushed out several times, and the lotion used frequently as a mouth-wash. This will give great relief in a short time. If the pain is very acute, and there is a history of the tooth having been fractured, the pain is often due to the end of the pulp projecting from the broken root. Relief will be given by drying the socket and swabbing it out with pure phenol, or instilling powdered orthoform.

Conclusion.

It must be emphasised that the palliation of toothache cannot always be promised by measures short of those only available to the dentist. But the attempt to relieve pain is always worth making, and if a correct diagnosis has been made the attempt will often be successful.

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[1] Jour. Amer. Med. Assoc., Nov. 10th, 1923.

Public Health Services.

A BRIEF HEALTH SURVEY.

DURING last year numbers of reports reached us, often containing in addition to the prescribed tables and summaries the considered views of men and women engaged in various branches of the public health service upon the material presented to them in 1922. We have already devoted considerable space to comments upon some of these reports—space precluded noticing every one—and it may be of interest to recapitulate here some of the more general lessons to be drawn from them.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Statistics.—Apart from the epidemic of influenza during the first quarter, 1922 was a healthy year. The death-rate in most districts was a low one. The infant mortality-rate was frequently the lowest on record, although as usual the mortality among illegitimate infants was double that of legitimate. In many districts the tuberculosis rate, though low, showed a slight rise compared with 1921. The cancer rate in most districts was higher than that for all forms of tuberculosis. Many medical officers of health issued leaflets on cancer, the chief points emphasised being the avoidance of all forms of chronic irritation and the need for securing immediate medical advice on the appearance of well-recognised danger signals. The fatality of diseases of the respiratory system was largely increased by the influenza epidemic and a comparison of the fatality of these diseases in various districts showed a marked difference between town and country and between towns with clean air and those with dirty air. The reports have not indicated any serious desire on the part of the public to tackle the subject of smoke prevention.

Tuberculosis.—Many medical officers expressed dissatisfaction with the results of expenditure on tuberculosis schemes, and a considerable number stressed the importance of establishing complete convalescence after ailments of childhood and thus preventing the onset of active tuberculosis. A general complaint was that the disease is not notified at a sufficiently early stage. There appears to be a shortage of accommodation for advanced cases especially in counties, and a general shortage of accommodation for the so-called pre-tuberculous children and for children suffering from what is known as surgical tuberculosis.

Maternity and Child Welfare.—The need for more maternity homes appears to be general, and is rendered more urgent by the scarcity of houses. Many medical officers point to the necessity for more efficient antenatal work if the high maternal mortality and damage-rate from childbearing and the more or less stationary neonatal mortality are to be combated. The statistics show a great difference in the childbirth mortality in the various districts. For example, during 1922 the maternal mortality from childbirth in Glasgow was more than twice that of Liverpool or Birmingham. What has been the effect of the scarcity of houses on this mortality it would be difficult to say. Several schemes have been described in the reports under which the midwives are subsidised to carry out elementary antenatal work. More and more of the births are being attended by midwives.

Venereal Disease.—From most centres a decline in cases and an increase in attendances is reported. This is all to the good, but the reports show that a more determined effort is needed to secure control of the syphilitic expectant mother, and also the provision of immediate skilled treatment for cases of ophthalmia neonatorum.

Housing.—An almost general scarcity of houses is reported. Renovation of existing houses is thereby rendered impossible. Trade depression and high cost interfere with proper repairs. There is evidently much overcrowding. New municipal houses are frequently sublet in part because the rent is beyond the reach of the tenant's pocket. Several medical officers prophesy an increase in tuberculosis if an adequate solution of the housing problem is not found soon.

General Sanitation.—Owing to the need for economy, little is being spent on schemes of drainage and sewage disposal, water-supplies, conversion of privies, hospital and sanatorium extension, public abattoirs, and the like. There are many complaints with regard to refuse dumps, especially with regard to London refuse, but again the need for economy appears to stand in the way of an effective solution.

Administration.—Better coördination between child welfare and school medical departments has been frequently advocated in the reports. Closer coöperation between county councils and urban and district councils has been arranged, for example, in the case of Essex and Derbyshire. Large urban districts wish to have the control of the midwives brought into their maternity and child welfare schemes. The unvaccinated condition of the population has been a subject of frequent warning. There is a welcome tendency, in these days of motor ambulances, to reduce the number of white elephants by means of joint small-pox hospitals and to avoid the danger of missed cases of small-pox by utilising the services of expert diagnosticians. Such improvements in administration cost nothing.

Health Education.—Many medical officers lay great stress on the advantage to be expected from the better education of the public in hygiene, and more particularly in the right choice of food. It is unnecessary to labour the point that an educational policy of this kind is possible when other more ambitious schemes have to be postponed on account of financial stringency.

From the public health point of view it may be conceded that 1922 was a very difficult year owing to the prevalence of distress due to unemployment. Careful inquiries have been made in many districts, and there is some satisfaction in being able to record that owing to the coöperation of the various relief organisations little or no effect of the continued distress has shown itself either in the mortality-rates or in the state of nutrition of the school-children.

SCHOOL MEDICAL SERVICE.

A considerable number of school medical officers' reports have passed through our hands during the year, and, much as we have been impressed by the high standard of attainment in face of formidable difficulties, practical as well as economic, the real sincerity of effort presented in these reports has impressed us even more. The aim of the school medical service is dissemination of health by prevention of disease in the young, and encouragement of a health conscience amongst the population generally. A health conscience is by no means synonymous with the health consciousness, rapidly being fostered in American schools by means of instruction and literature, which, if not checked, is likely to have a disastrous psychological effect sooner or later. In this country the school doctor is now an institution firmly established in the general routine. His removal would be a national calamity. The children of those who passed through his hands 15 years ago when medical inspection of schools became statutory are making his acquaintance to-day. In many areas treatment for defects follows closely on the heels of inspection, and it would not be unsafe to predict that in ten years time this will be the natural order throughout the country. Special schools of every kind, these reports show, have materialised, and are materialising through the efforts of the school doctor in spite of financial stringency.

We cannot help being struck, however, on reviewing the reports, by the profound apathy of public opinion on the general conditions prevailing in the majority of elementary schools. Last year school medical officers'

reports on school buildings revealed a standard of general hygiene alarmingly low. This year we find very little record of improvement in this direction. The amenities of life in our elementary schools should surely approach as far as possible those of the ordinary middle-class household. How far they fall short of this is known to every school doctor. Children, perhaps more especially in country districts, leave school at 4 P.M. in the wet clothes and sodden boots they sat down in at 9 A.M. In such manner are laid the foundations of disease—tuberculosis, rheumatism, chorea. It ought to be possible—indeed, a few schools find it perfectly simple—for children to make in class cheap warm slippers and woollen stockings into which to change on entering school; and to devise some means of drying clothes and boots, even in the depths of the country, ought not to be past the wit of man. Then again there are schools where wash-hand basins, but neither soap nor towels, are provided; there are others with wash-hand basins but no water; in some for a hundred children the provision is a single towel, changed weekly. In not one school in a dozen are children's closets supplied with toilet paper; indeed, one school doctor reported that conditions in this direction were worse than in the front-line trenches. Many schools in this country have no drinking water, many provide one drinking cup for the whole school, others one for each department. The continental system of releasing a jet of water into the mouth by pressing a button has hardly reached us yet. In the matter of floor space, too, England has, of all the world, the smallest national requirement. It has not been changed since the Education Act of 1870.

These points are brought forward in no carping spirit. The school medical service has done more in a few years to raise the health standard throughout the country than was ever contemplated. It has demonstrated, too, by careful research on growth, malnutrition, and mental retardation, amongst other things, the important rôle played by environment in the moulding of character. Although by no means the major part of the child's life is spent in school, it is to the school he looks for guidance, and habits formed there go far to making the man. Theoretical teaching of hygiene without practical application is wasted time and effort. A higher minimum requirement of everyday hygiene should be laid down for the public elementary schools; and while recognising how difficult a task awaits the reformer in this direction, we would, in all seriousness, recommend its urgency to the school medical service, which alone can educate public opinion on such a question.

Mental Hospitals Service.

Improvements in this service are to be observed in many cases. There has been a notable increase in the provision of out-patient treatment for incipient cases. Buildings which had fallen into dilapidation during the war years have been repaired or reconstructed, better diet is reflected in a reduced incidence of tuberculosis, staffs have been increased, and more specialised work is being undertaken, some pathological, psychotherapeutic, and medicinal, by resident staffs, and some, such as dental and surgical, by recently appointed visiting officers. There are, however, institutions in which some of these changes have yet to be made. There are many more in which formidable barriers stand in the way of changes which are deemed necessary for the welfare of their inmates. The buildings themselves are ugly without and within, badly arranged, inadequately lighted and heated. No separate accommodation exists for recent admissions or for cases of open tuberculosis. The airing grounds are small, and the washing, sanitary, and general domestic accommodation antiquated. Laboratories, therapeutic baths, operating theatres, X ray equipment, and private rooms for interviews and psychotherapy are non-existent. Medical officers are often inadequately paid, and entry into the service is discouraged by the fact that married quarters are often available only for superintendents. Promotion is slow, and dependent rather on business and organising ability than on professional attainments. Women whose character and education fit them for the work of a mental nurse cannot be persuaded to enter the nursing service in sufficient numbers, and an unduly large proportion of nurses, both male and female, never obtain their certificate. Provision for "after-care," where it exists, is patchy and incoördinated, and money allowances are often not available for patients on leave of absence.

Not the least anomalous feature of the present service is its gross inequality. Whereas the native of Cardiff, Birmingham, or Edinburgh is received into a modern or modernised hospital, excellently staffed and equipped, the pride and concern of every intelligent ratepayer in the city, the insane poor of many districts must be relegated to institutions labouring under the depressing handicaps outlined above, the work and needs of which are practically unknown to the vast majority of those who, as local government electors, are responsible for their welfare. Too much is being sacrificed to economy, and as the law stands no one can interfere. Visiting commissioners "recommend," and occasionally "protest," as at the flagrant example of Carnarvon, where the medical staff has been reduced deliberately from three to two members, but their biennial recommendations are repeated so interminably, so plaintively, and with so little effect, as to become ridiculous and even pathetic.

It would be unwise to rely on the likelihood of convincing each individual local authority of the need for heavier expenditure on the insane. But there is another reason for the need of some sort of unified control, for only under such control could the existing and projected resources of the service be used to the best advantage. When such an authority comes into existence, it will destroy some of the oldest and most dreary asylums, utilise the remainder of this class for the housing of the incurably insane, and build new and genuine "mental hospitals," properly staffed and equipped, for the reception of recent, and the treatment of recoverable, cases. Although there is no immediate prospect of any changes on this scale the volume of more or less enlightened public opinion from which they must ultimately result has certainly increased during the last few years.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. A. R. H. Skey, R. H. Mornement, J. H. Fergusson, H. C. Whiteside, and J. R. Muir to be Surg.-Capts.

Surg. Comdr. C. J. E. Cock is placed on the ret. list with the rank of Surg. Capt.

Surg. Lt. G. D. G. Fergusson to be Surg. Lt.-Comdr.

ROYAL ARMY MEDICAL CORPS.

MILITIA.

Maj. W. R. Gardner relinquishes his commn. and is granted the rank of Lt.-Col.

TERRITORIAL ARMY.

Capt. W. Baxter (late R.A.M.C.) to be Capt.

TERRITORIAL ARMY RESERVE.

Capt. D. H. Scott, from General List, to be Maj.

ROYAL AIR FORCE.

Flying Officer G. Kinneir is promoted to the rank of Flight Lt.

INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lt.-Cols. J. Entrican and D. MacD. Davidson.

Shiv Das Suri, Shambhoo Dayal Misra, Subbier Annaswami, and Amar Nath Duggal to be temp. Lts.

Special Articles.

SURGICAL TUBERCULOSIS IN ADULTS: THE WORK OF THE M.A.B.*

ST. LUKE'S HOSPITAL, LOWESTOFT.

VISITORS to Lowestoft will doubtless remember the magnificent Empire Hotel which was built on the front about a score of years ago. The promoters of this palatial building grudged no expense, and they anticipated that it would prove an attractive and fashionable centre. It was not, however, a great success, and when the war came, the hotel was occupied by soldiers, and its parquet floors supported a machine gun instead of dancers. For some time after the war the hotel stood as an empty neglected shell—a white elephant embarrassing its owners. At this stage the Metropolitan Asylums Board stepped in and careful inquiries were made as to the suitability of this building for a hospital for surgical tuberculosis. This proving to be the case, the purchase was completed and the hotel with its beautiful oak and mahogany panelling, stained glass windows, lofty billiard room, library and reception rooms came into the possession of the M.A.B. Many alterations had, of course, to be made. The central heating system was very imperfect and had to be entirely reconstructed. Even the kitchens required a certain amount of re-modelling; a grill, for example, may be essential to an epicure, but is out of place in a hospital. The six storeys are connected by four lifts, only two of which carry human beings. The hospital provides its own electricity, it has an up-to-date X ray outfit, a 12-inch coil (100 volts), a Coolidge tube, &c.

St. Luke's Hospital for Surgical Tuberculosis at Lowestoft.

Scope of the Hospital Work.

The hospital takes only cases of surgical tuberculosis in adults—i.e., patients over the age of 16. It is the only institution of its kind under the M.A.B. and it fills an important gap in the tuberculosis scheme of this organisation. Before St. Luke's Hospital was opened on May 9th, 1922, the M.A.B. possessed no special institution to which it could admit adult cases of surgical tuberculosis, although in Queen Mary's Hospital at Carshalton and Princess Mary's Hospital at Margate it had for some years past maintained several hundred beds for juvenile patients of this type. St. Luke's is open to L.C.C. patients, and about 99 per cent. of the patients hitherto admitted are Londoners. It is inevitable that a first-class institution like this must attract the attention of the health authorities in the neighbourhood, but the needs of the L.C.C. have, of course, to be satisfied first. Nevertheless, if an arrangement for the admission of local cases could be made, it is one which might well be profitable to all parties. The hospital has facilities for expanding its present accommodation, and the cost of running a few dozen more beds would be considerably less in this institution than in an independent concern requiring a new central organisation.

The female staff numbers 66, including 37 nurses. The male staff numbers 27 and lives outside the institution, while the female staff sleep in. The doctors are resident. At present the medical superintendent has only one assistant, but a third medical officer is shortly to be appointed. The wards vary greatly in size; the largest female ward has 25 beds. On the first floor two or more rooms have been thrown into one, while others retain their original size. The wide range of choice between large, medium-sized, and small wards has enabled the staff to distribute the patients to a certain extent according to their instincts—the gregarious instinct or its opposite. What this means to the comfort of the patients, only those can tell who have had experience of running a large institution like this.

Accommodation.

At present there is accommodation for 94 male and 70 female patients. There is no arbitrary limit to the duration of residence, the average being from six to eight months for patients with tuberculosis of the bones. This average is only four to five months for patients suffering from tuberculous adenitis or peritonitis, and the patients who come for observation and diagnosis sometimes only stay a few weeks. Pulmonary tuberculosis does not, of course, qualify a patient for admission, but in a small proportion of cases it is found as a complication of surgical tuberculosis. It must, by the way, be sometimes rather

* An article on Surgical Tuberculosis in Children: the Work of the M.A.B. appeared in THE LANCET of Sept. 23rd, 1922 (p. 683), and one on Pulmonary Tubercle in Adult Males in THE LANCET of Dec. 2nd, 1922 (p. 1189). All three articles are the outcome of visits by our own Commissioner).

difficult to say when surgical tuberculosis is complicated by pulmonary tuberculosis, and when the reverse is the case. At first a relatively high proportion of the total were gland cases, an accumulation of which had occurred before the hospital was opened. But it is anticipated that the proportion of spine and joint cases will increase as time goes on. During the last 12 months the hospital discharged the following cases: Spines, 63; hips, 43; knees, 25; other joints and bones, 30; abdomen, 16; peripheral glands, 28; genito-urinary system, skin, &c., 14.

Factors in the Treatment.

Dr. W. M. Oakden, the medical superintendent, considers rest by far the most important remedy in the acute phase of surgical tuberculosis. About two-thirds of the patients are confined to bed, the numerous verandahs of the hospital providing plenty of fresh air and some of the sunlight which struggles out even in winter, and in the British Isles. Heliotherapy and radiotherapy are not practised with the fervour shown in some of the continental hospitals for surgical tuberculosis, and tuberculin (B.E.) is given only in selected cases, the results being sometimes good and sometimes indifferent. But rest by immobilisation is a fine art at St. Luke's, and the spinal frame, devised by Dr. Pugh for juvenile cases, and slightly modified by Dr. Oakden for use with adults, is a remarkably ingenious contrivance on which the patient can be left for a month without disturbance and without fear of bedsores and other calamities. It is suitable with slight modifications for hip as well as for spine cases, and among its many merits are its non-retention of crumbs, sweets, and the like, so productive of sore backs, and the facility with which it allows the use of the bed-pan. Abscesses that do not subside with immobilisation are aspirated, while sinuses are injected with bismuth-iodoform paste after the removal of existing sequestra by operation. It is not the practice to leave sequestra to the expulsive and curative action of heliotherapy alone. The treatment of lupus consists in scraping and cauterising with such agents as carbolic acid, acid nitrate of mercury, or fuming nitric acid. The metal of which spinal braces and other splints are made is "duralumin," which is remarkably light and strong.

Plaster immobilisation is also practised, but the celluloid jacket or splint is not favoured for various reasons, such as the lengthy process of production, the cramping of certain necessary movements which it entails, and the sometimes undesirable warmth it gives. The hospital is equipped with a well-stocked dispensary, but it is seldom found necessary to give patients drugs. The diet is ample, plain, and nutritious; there are four meals a day, and snacks between meals as well as stuffing patients with extra eggs, and that sloppy nutriment known as milk, are not encouraged. The operating theatre is well equipped, 100 candle-power lamps being placed so as to give the operator excellent illumination. It is, however, seldom necessary to operate on cases coming under treatment at an early stage. Excision of a knee or other joint is performed where ankylosis is a moral certainty and time can therefore be gained in the period of treatment. It is the opinion of Dr. Oakden that in some cases early operation defeats its object, better results being obtained by waiting until the general condition of the patient has improved by some weeks' residence in hospital away from London. Bier's treatment by passive congestion is not practised at St. Luke's. It is perhaps inevitable that some of the cases sent to St. Luke's with the diagnosis of tuberculous cervical adenitis should be found to have carious teeth, and in this connexion it should be noted that a Lowestoft dental surgeon attends regularly.

Psychic Factor.

There is much to be said in favour of a hospital which is not built as such, but is adapted from a private mansion or hotel. Beautifully carved oak and mahogany may doubtless be accused of harbouring dust and germs, but at least it does not harbour that chilling spirit that lurks in the bevellings of the sanitary architect. In a chronic disease like tuberculosis the psychic factor is most important, and the patient who enters St. Luke's is persuaded by his surroundings to feel himself the inmate of a first-class hotel and not of an isolation hospital. And were not the subjects of tuberculosis promised first-class hotel accommodation when the Insurance Act was born? St. Luke's Hospital is proof positive that politicians are sometimes able to carry out their intentions.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

The Increased Mortality-rate in Hungary.

THE Central Statistical Bureau of Hungary has just published the figures relating to the rate of population in the year 1922. The importance of these figures lies in the fact that they reflect the situation prevalent in the country for the last three years; the consequences of a lost war and the unblessed litigations following it. The births are seemingly at a standstill, whereas the mortality-rate has increased over the already large figure for the previous year. Amelioration of this state of affairs is the urgent duty of the Supreme Sanitary Council. The Council does not attribute the unfavourable death-rate to bad hygienic conditions, but rather to the adverse economical position of the land. The total number of marriages in 1922 was 83,372—that is, 4717 less than in the previous year. There were born 220,898 living children against 211,697 of the preceding year, an increase of 1·2 per 1000 of the population, but the number of births is not at all satisfactory. The slight rise is destroyed by the higher death-rate. In the year 1921 there were 146,485 deaths, while in 1922 there were 154,857. The ratio per 1000 rose from 18 to 19·6. The number of deaths due to infectious diseases is remarkable. Tuberculosis claimed first place with 19,057 cases, the mortality-rate being 2·41. Measles and scarlet fever caused the death of 6225 children compared with 2620 in 1921. The infant mortality-rate is still on the increase; in 1922 it was 195 per 1000 live births. The increase of population arising out of the difference of births and deaths amounted in 1922 to 69,743, or 8·5 per 1000 inhabitants; this corresponds to an improvement of 0·2 per 1000 in comparison with the previous year. During last year there were 1469 emigrants, mainly to the United States of America, while immigrants numbered 1802.

A New Factor in the Ætiology of Ectopic Gestation.

Dr. Alexander Gross writes in the *Orvosok Lapja* that the evident widespread avoidance of pregnancy in married women may be attributed with some justice to the economical crisis following the war, and the severity of the struggle for life. It was formerly a common occurrence for wives with large families to seek the advice of doctors regarding the different contraceptive methods and drugs, but it now often happens that young engaged girls come to doctors for advice how to be childproof in their ensuing marriage. At present one of the contraceptive methods in vogue is the intra-uterine injection of iodine. The wives are "demanding" this, says Dr. Gross, if their menstrual period is even a few days overdue. This procedure may be injurious. Laszló, a Hungarian, has called attention to the fact that iodine injections occupy an important place in the ætiology of ectopic gestation. Who can tell the position of the fecundated ovum—if it is fecundated at all—at this stage of development? A prophylactic iodine injection may cause the ovum to adhere at an irregular situation and thus bring about a dangerous condition. Dr. Gross explains this as follows: (*a*) The effect of the iodine is to produce inflammation and thickening of the mucous membrane of the uterus and consequently of the ostium uterinum of the Fallopian tube, which is normally of 1 mm. diameter.

The ostium contracts, and thus the ovum, which is of 1 mm. diameter when it reaches the ostium, cannot get into the uterine cavity, and is obliged to settle in the tube. (*b*) With the iodine injections a part of the iodine gets into the tube and causes an endosalpingitis catarrhalis, and this, according to Fränkel, stays the migration of the ovum without retarding its development, thereby favouring the embedding of the ovum in the tube. He quotes several cases of his own, in which the occurrence of ectopic gestation could be brought in ætiological connexion with intra-uterine iodine injections. Moreover, the presence of iodine in the tube can give rise to serious abdominal consequences.

New Order of Examinations in the Medical Faculty.

The official journal of Hungary contains the order relating to the alterations in the scheme of the examinations to be passed by medical students. In order to get a medical diploma the candidate will have to pass four examinations instead of three, as at present, and as the first examination will be divided into two halves there will be, in effect, five examinations necessary. One-half of the first examination (physics and chemistry) must be passed at the end of the second session; the second half (anatomy and physiology) at the end of the fourth session. A candidate who fails in the first part may sit again in the first month of the third session; if failing again, then at the end of the fourth session. Re-entry for the second part of the examination is allowed only at the beginning of the fifth session. The second examination must be taken as hitherto at the end of the tenth session—that is, if the student has received the absolutorium (a certificate of having attended all subjects for the prescribed period of at least ten sessions). This examination, written and oral, will be easier than previously, as it will consist of general pathology, pharmacology, and pathological anatomy only. In the third, or final, examination the order of subjects has not been altered. There are two parts: the first embraces all practical work and the second consists of forensic medicine and public hygiene. The new regulations embody several useful innovations, and the division of the examinations makes them less of a strain. On the other hand, by spacing the intervals between the examinations the period of study has been extended by one full year.

BOGUS MEDICINE IN THE UNITED STATES:

THE VALUE OF HONEST JOURNALISM.

(FROM AN OCCASIONAL CORRESPONDENT.)

IT has been publicly stated that no less than six medical boards grant licences to practise medicine in the State of Connecticut.[1] One of these boards is composed of eclectic doctors who are authorised to give diplomas to those who wish to practise along these lines. Last summer the State Commissioner of Health began to investigate some of the licences granted by this board with the result that 53 of them were withdrawn. The State legislature thereupon passed a Bill to make the licences valid again, but the Bill was vetoed by the Governor of the State. The movement for reform, started by the *New York Evening Post*, I believe, seemed to be leading nowhere. There the matter might have rested but for the enterprise of a reporter on the St. Louis *Star* in Missouri. This gentleman was supplied with money by his enterprising journal, and by the judicious use of $3000, and after 2 hours and 22 minutes of intensive study, he was soon able to report that he had obtained (1) a certificate stating that he had completed his high school course in Missouri, (2) a document granting him the degree M.D. of a university that has been extinct for five years, (3) a diploma attesting the degree of doctor of chiropractic, and (4) a licence to practise medicine in Tennessee. The ingenious and humorous journalist thus let in a flood of light upon the secret organisation of the diploma manufactures of the United States.

Briefly, the procedure was to forge a diploma from some third-rate medical college in the State wherein their customer desired to practise. If it were the diploma of some college, which through the educational propaganda of the A.M.A. had been obliged to close down, that was so much the better. In the event that no such college existed in the desired State, then a licence to practise in some other State must be obtained whence by reciprocity the same end could be achieved. Thus it came about that Arkansas and Connecticut were particularly useful. In Connecticut it was necessary for the applicant to pass the State examinations. Sometimes this was arranged by proxy, at other times an examiner could be induced to pass out the questions beforehand, and the little group of aspiring "physicians" would spend an evening memorising the correct answers.

The immediate effect of this exposé has been the reviewing of licences. Eighteen eclectic doctors, in addition to those already deprived of their deceitful status, and some of them had been practising as long as nine years, have now lost their licences in Connecticut. Missouri has decided to review the licences of the 6000 physicians practising in that State, and in New York city a survey is being made of the educational history of all hospital internes. But the final results are likely to be still more important, for the wide publicity given to this scandal by the lay press has aroused public opinion all over the country. The *Survey* (Dec. 15th, 1923) forecasts a special session of the Connecticut legislature to revise the Medical Practice Act. If this revision is brought about, as it almost certainly will be, and certain other States also fall into line, a very valuable advance in American medical standards will be accomplished.

I know that the existence of this scandal has for years been perfectly familiar to your readers, but the array of sound journalistic opinion on the side of right bids fair to introduce reform.

[1] Laws and Board Rulings, published by the A.M.A. and revised to July, 1923, lists three boards—viz., regular, homœopathic, and eclectic.

SOUTH AFRICA.

(FROM A CORRESPONDENT.)

The Responsibility for a Swab Left in a Patient.

JUDGMENT was given recently at the Queenstown Circuit Court, Cape Province, by Mr. Justice van der Riet, in a case in which the plaintiff, Gwendoline van Wyk, sought to recover the sum of £2000 from Dr. Harry Lewis, of Queenstown, for alleged negligence in leaving a swab in her abdomen after an operation. She sued in forma pauperis, and was represented by Mr. Advocate Pienaar, of the Capetown Bar. Mr. Advocate Lewis, K.C., and Mr. F. B. van der Riet appeared for Dr. Lewis. The plaintiff alleged in her declaration that at Queenstown Hospital, on Feb. 3rd, the defendant operated upon her; that he carelessly and negligently left a swab within her body; that on divers occasions subsequently he examined her, but failed to detect and remove the swab; that it remained till Feb. 15th; and that, owing to its presence, she had suffered great bodily pain and anxiety, and had been put to considerable expense. Mr. Justice van der Riet gave judgment for the defendant. He found that, although the swab was left in the body, Dr. Lewis was not guilty of any negligence, and that he was entitled to relegate the duty of checking the number of swabs to the theatre sister.

Transvaal: Resignation of Dr. C. L. Leipoldt.

The Transvaal has suffered a serious loss by the resignation of Dr. C. L. Leipoldt, medical inspector of schools for the province. Dr. Leipoldt's resignation for private reasons was not unexpected, but it will be difficult to replace him. He was formerly an assistant

medical officer under the London County Council, which he left to become the pioneer of school hygiene in South Africa. He organised here a scheme of medical inspection and treatment which has served not only for the Transvaal, but as a model for South Africa as a whole, and his work on hookworm disease is now a classic. Dr. Leipoldt's energy and enthusiasm in any work he undertakes are boundless, and doubtless more will be heard of him.

The department has sustained a severe loss, too, in the death of Dr. Anne F. Cleaver, little more than a year ago. Dr. Leipoldt puts on record in his last report his appreciation of the good work she accomplished. A representative committee has been formed for the purpose of perpetuating her memory by the establishment of a university scholarship to be called the Anne Cleaver Memorial Scholarship, and by the erection of a mural tablet in the Johannesburg School Clinic, "where she worked so effectively, and which she was largely instrumental in establishing."

Medical Council Conference at Johannesburg.

A South African Medical Council Conference, dealing with the uniform training of nurses and midwives in the Union, was opened at Johannesburg on Dec. 3rd, 1923. The Cape Medical Council was represented by Drs. Darley-Hartley, F. C. Willmot, and Barnard Fuller; the Free State by Dr. G. D. de Kock; Natal by Dr. W. Russell Strapp; and the Transvaal by Drs. W. T. F. Davies, J. van Niekerk, A. H. Watt, and R. P. Mackenzie. The South African Nurses' Association was represented by Dr. John Tremble and Miss B. G. Alexander, general secretary, who acted as delegates in an advisory capacity.

A Medical School for South African Natives.

A proposal has been formulated for the institution in the near future of a medical school for native students at Fort Hare. The idea is that preliminary education in the fundamental sciences will be given for two years, to be followed by a three years' course in clinical work in the Durban coloured hospital.

IRELAND.

(From our own Correspondents.)

An Inquiry into the Medical Services in the Free State.

It is announced that the Minister of Finance has decided to appoint, in the present year, a committee of inquiry into the working of the Health Insurance Acts in the Free State, and that such inquiry will include the question of the medical services generally, as well as in their relation to the medical treatment of the insured people and their dependents. Such a step has been urgently needed since the establishment of the Free State Government. In 1920 the Irish Public Health Council drew up a radical scheme of reform for the medical services of the country, including the provision for the treatment of the insured. No action was taken on it by the then Government, but the first Dail, and more recently the Free State Government have encouraged some of the changes recommended by the Irish Public Health Council, but the changes have been adopted in a piecemeal fashion. It is difficult to say whether more confusion than order has not resulted from these reforms. It is to be hoped that the committee of inquiry will be a representative and capable body in which the profession and the public can have confidence, and that it will tackle its work with courage.

National Health Certification.

The Irish Medical Committee was warned a few weeks ago by the National Health Insurance Commission that, the Government having declined to make any further grant for certification purposes after the end of 1923, it would be impossible to provide remuneration on the same scale as hitherto. The Chairman of the Commission has now submitted to the Irish Medical Committee a memorandum, in which he sketches the history of the special grant, and outlines the proposals of the Commission for the future. He states that, in 1915, after a prolonged controversy, the British Treasury agreed to make a grant not exceeding 2*s*. 6*d*. per insured member for the purpose of defraying the cost of certification in Ireland. The maximum grant for any area was limited to 2*s*. 6*d*., and a scheme was prepared which provided for three rates of capitation, varying from 2*s*. 6*d*. in the most scattered rural areas to 1*s*. 3*d*. in urban areas. These rates came into operation in the beginning of 1916, and continued until Jan. 1st, 1920, when an increase of 40 per cent. was approved owing to the increased cost of living. In 1922 half of the increase was taken off, and since January, 1922, the capitation rate has stood at 20 per cent. over the original figures. Early in 1922, with the disappearance of the Treasury grant in Great Britain, the special grant in the Free State would also naturally have disappeared. The Insurance Commission, however, felt that a very serious position would arise if the cost of certification was placed on the funds of approved societies, owing to the fact that political troubles had caused a considerable amount of non-compliance as regards stamping. The Commissioners approached the Government, and, as a result of their representations, the grant was continued for the years 1922 and 1923.

The Proposed Capitation Fee for 1924.

The assent of the Government was given on the condition that no further grant would be asked for, and that before the end of 1923 arrangements would be made to provide the cost of certification otherwise than by a State grant. In these circumstances the Commission took the advice of the Chief Government Actuary as to how far it would be safe to draw on the benefit funds of the societies. In his report, which is quoted by the Commission, the actuary states definitely that the benefit funds could not safely be touched at all for this purpose, and he gives his reasons why the problem in Ireland differs from that of Great Britain. He suggests, however, certain other subsidiary funds from which some monies could be taken. In addition to the sources suggested by the actuary, the Commission is willing to ask for legislative authority to transfer other monies temporarily at their disposal, which would make up in all a sum equal to the product of a rate of 2*s*. on the average per insured person, and which would be devoted to the cost of certification in the Free State. The net proposal, as far as the medical profession is concerned, is that the profession is asked to accept a reduction of 3*d*. in the average capitation rate, it being proposed at the same time to take 5*d*. off the administration expenses of the societies. The proposal is confined to the year 1924, and the Commission hopes that the profession will accept the offer now put forward, and prevent a deadlock arising as to the provision of certification for the current year.

The late Sir John Walton Browne.

The death of Sir J. Walton Browne, which was announced in your last issue, has caused very deep regret to a wide circle of friends in Belfast, both among the medical profession and the general public. Sir Walton Browne filled many posts of honour in the gift of his professional brethren. In 1913 the honour of Deputy Lieutenant was conferred upon him by Lord Pirrie, K.P., and when in 1921 he received his knighthood, it was felt by all his many friends as a well-merited recognition of his services. He enjoyed great popularity among his medical brethren in Belfast, to whom his genial and kindly character, which was not obscured by an occasional brusqueness of manner, endeared him in a high degree. No less high was his repute as a surgeon, especially in the branch of ophthalmic surgery. He had the gift of friendship, and was never more at home than at the social board, public and private. His presence radiated good fellowship and hearty enjoyment. He was also much beloved by his patients, and by his subordinates in the various hospitals with which he was connected.

Sir Walton Browne was twice married. By his first wife he had a son, the late Dr. James Browne, who died some years ago. By his second wife, who died two years ago, he had a daughter who is now the wife of Colonel Young. The funeral took place on Dec. 22nd, when the large and representative gathering bore witness to the esteem in which he was held.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

The Glasgow Western Infirmary.

THE annual Christmas meeting of the infirmary was held in the Dispensary Hall on Dec. 24th last. Colonel J. A. Roxburgh, the chairman of directors, in outlining the work of the past year, said that every bed had been occupied for practically the whole period, nor was the waiting list reduced. He referred to the absence from teaching work of Sir William Macewen, now in Australia, and of Sir Kennedy Dalziel, incapacitated by illness. The training of nurses under Miss Gregory Smith had been further facilitated by the addition of a lecture-room and a study-room, and the number of pupils in the massage department had been maintained. Reference was also made to the use of insulin in the medical wards, and it was pointed out that these patients were more costly to maintain than the average. It had been possible to reduce the ordinary expenditure for the year by about £3000, but there had been a falling off in the amount of subscriptions, partly as a result of unemployment, so that the deficit for the present year would not be less than for the preceding one (£13,000). During the year the endowment fund had been increased by £22,500, and there were now 82 beds permanently endowed in the infirmary. The legacy received last year from the trustees of the late Mr. Alex. Elder had been used for an extension to the nurses' home, now nearly completed, a nurses' study and lecture-room, now completed, and a memorial chapel to Mr. Elder, which would be finished next year. Colonel Roxburgh also referred to the experiment which is now being tried in the McAlpine Nursing Home, Glasgow, of offering accommodation at reduced rates to those whose income is limited, and hoped that this innovation would lessen the long waiting list of the infirmary. On the other hand, subscriptions to the infirmary from this type of patient had last year totalled £1722. Lady Blythswood then presented the nursing prizes gained during the year. During the meeting Colonel D. J. Mackintosh, the medical superintendent, was informed that another bed had been endowed in the hospital.

Medical Demonstrations for Practitioners.

The Glasgow North-Eastern Division of the British Medical Association have arranged a short series of demonstrations during the present winter to which all the medical practitioners in the area are invited. The first of the series was held on Dec. 12th, when a demonstration was given in the orthopædic department of the Western Infirmary, Glasgow. After a brief statement on the work of the department and on the course of training received by the students of massage, practical illustrations were given of the various methods of treatment, including massage, medical gymnastics, and electrical treatment. A number of patients were shown illustrating the types of cases suitable for the various forms of treatment. About 50 members were present, and the demonstration was much enjoyed.

Hospital Extension.

At a meeting of the Campbell Hospital Board at Portsoy, Banffshire, on Dec. 27th, the question of providing an observation ward at the hospital was discussed. A proposal for a discharging ward was also brought forward. Although the hospital provided ample accommodation for zymotic diseases arising in the neighbouring districts, many cases were admitted where an immediate diagnosis was quite impossible; such cases required investigation, and should be kept in an observation ward until an accurate diagnosis could be made. As regards a discharging ward, it was noted that certain cases of scarlet fever took a considerable time before they were free from infection. The board decided to adopt the principle of observation and discharging wards, and agreed to engage Mr. McCallum, architect, of Cullen, to prepare plans and estimates for the new wards and to report to a special meeting of the board.

At a meeting of the Kingseat Mental Hospital, Aberdeenshire, on Dec. 27th, a communication was submitted from the General Board of Control, Edinburgh, approving of the proposed extension of the hospital. It was agreed to instruct the architect to prepare plans and estimates for two new villas and also an addition to the nurses' home.

Correspondence.

"Audi alteram partem."

ON SOME USES OF DIGITALIS.

To the Editor of THE LANCET.

SIR,—On the above subject (THE LANCET, Dec. 22nd, 1923, p. 1376) Dr. Harrington Sainsbury's confession of faith may be summed up as follows: "I believe in drugs which will act directly and beneficially on the cardiac power of contraction." He is prepared with reasons for his faith, but has not grasped quite clearly all that is conveyed by his dogma. Pharmacologists teach that the action of digitalis on the heart is twofold, being indirect through the medium of nerves (the vagus), and direct through its action on the contractile tissues. Clinicians, on the other hand, while recognising the therapeutic effect of digitalis through the nervous system, are divided in opinion as to the existence of any direct and beneficial action on the contractile tissues of the heart. All are agreed as to the indirect influence of digitalis on the heart through the nervous system, and the only point of difference is as to the direct and beneficial action of digitalis—or any other so-called heart stimulant—on the cardiac contractile tissues.

In giving reasons for his belief, Dr. Sainsbury deals first of all with physiological conditions under which the heart is constantly receiving through the nervous system stimuli from all parts of the body, which regulate its action. He describes these stimuli as "influencing directly the muscle fibres of the heart." Yet by his own showing the action is indirect and not direct, for the stimuli act through the nervous system and not directly on the heart. He next instances the case of a fainting subject revived by the application of strong ammonia to his nostrils. Here he says "the powerful stimulus of the ammonia has been projected from the mucous membrane of the nasal cavities, via the central nervous system, upon the heart." This is another example of reflex and not of direct action on the heart. Supposing the reviving patient uttered a cry, would Dr. Sainsbury say that therefore ammonia had a direct effect on the muscles of the vocal cords? Possibly the patient might use a swear word. Would Dr. Sainsbury then say that ammonia was a direct stimulant of bad language or the centre regulating such?

Leaving his clinical studies, Dr. Sainsbury next descends to the pharmacological laboratory for further proofs. Now let us grant him all the laboratory proof he wants. Let us grant that in laboratory experiments on the hearts of healthy animals, perfused or otherwise, digitalis has been shown to have a direct action on cardiac muscle, making it contract more and more firmly, until it finally stops in a state of tonic contraction—poisoned by digitalis. Were Dr. Sainsbury a pharmacologist only no harm would be done, but he is also a distinguished physician,

and the saddening thing is to see a clinician accepting the results of laboratory experiments as applicable to the treatment of diseased persons, without any attempt to test them carefully at the bedside. The assumption that laboratory experiments with drugs are sufficient to settle the question of their action and suitability in diseased conditions has probably led to more therapeutic failures than any other fallacy in medicine. No laboratory experiments could ever have taught us the action of digitalis in auricular fibrillation resulting from heart disease, because the same conditions do not exist in animals experimented on. To prevent misunderstanding, let me add that no one appreciates the value of pharmacological work in the laboratory more than myself.

Dr. Sainsbury completes his evidence by a reference to a recent paper by Dr. Bodon, of Budapest, on the Intracardiac Injection of Adrenalin. Dr. Bodon has had one case thus treated, but in foreign literature he finds references to 90 other cases. Prof. Velden has treated half of these—45 in all—and none of his patients lived more than eight hours after the injection. Whether this settles the question of direct action on the heart muscle or not must be left to Dr. Sainsbury, but the second part of his dogma—the beneficial action on the heart—is not left in much doubt.

Dr. Sainsbury is more provocative when he accuses the present writer of not having done justice to the facts of the case, or to the memory of past observers. He seems hurt that no reference was made to the knowledge of the type of case suitable for digitalis possessed by our teachers of 40 to 50 years ago. Why, Sir, it was known 150 years ago! Dr. William Withering, the father of digitalis therapy, wrote in 1785 as follows: "If the pulse be feeble or intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, or the anasarcous limbs readily pitting under the pressure of the finger, we may expect the diuretic effects (of digitalis) to follow in a kindly manner." Whether we call it 50 years or 150 years Dr. Sainsbury can see no sign of progress. Of this I am certain, that were Dr. Withering alive to-day he would acknowledge and welcome, as I do, the great advances in our knowledge of digitalis therapy made by Sir James Mackenzie and his co-workers. It is no injustice to the past to lay stress at times on the advances of the present. We are not a boasting nation, but English medicine is entitled to claim that Sir James Mackenzie has taught us something that was not known 40 to 50 years ago, else his name had not been honoured and his writings had not been studied in every part of the civilised world as they are.

I am, Sir, yours faithfully,

G. A. SUTHERLAND.

Wimpole-street, W., Dec. 24th, 1923.

OPIUM IN CARDIAC DYSPNŒA.

To the Editor of THE LANCET.

SIR,—I much regret if I have done an injustice to Sir Clifford Allbutt (THE LANCET, Dec. 29th, 1923, p. 1422) or to the authorities he quotes; yet I cannot but congratulate myself that a mistake of mine should have provided Sir Clifford Allbutt with an opportunity of emphasising my point in a way which no words of mine could have done, while at the same time reminding the profession of his classic contribution to the *Practitioner* of 1869. I regret that I do not possess a copy, but my recollection of it is that of an original and valuable advocacy of "morphia" hypodermically—and as distinguished from opium—in various forms of cardiac distress, with a note near the end upon dyspnœa; but I do not recollect that special reference was made to the violent paroxysms I referred to as cardiac asthma. The *St. George's Hospital Gazette* for 1909, I am sorry to say, I have not seen.

Had I been less intent on compressing my paper into a small space I should have recorded, at any rate, some of the references I discovered, and explained why few, if any, of them seemed quite to meet my experience in the use of opium (morphine, omnopon, and nepenthe hypodermically seem equally efficacious), in Cheyne-Stokes respiration, and cardiac asthma. Further, I should have explained why several eminent authorities who were good enough to read my paper before it was completed, and but for whose encouragement it would never have been written, considered that the cases recorded struck a note which might be useful both scientifically and clinically at the present juncture, when this use of opium does not appear to be generally recognised—three points, all of which were endorsed in the discussion that followed the reading of the paper.

But I have no wish to claim priority, and offer my sincere apologies to all to whom I may have unwittingly done an injustice, and specially to Sir Clifford Allbutt, to whose pioneer work in this, as in so many fields of medicine, I, in common with the rest of the profession, owe so much. On one point, however, raised by Sir Clifford Allbutt's letter I should like to express a view. "Cardiac dyspnœa" is a large subject which may be subdivided; and opium (or morphine) is, in my experience, chiefly of value in the paroxysmal forms which have but little reference to immediate effort. To one of these forms the term "cardiac asthma" has always seemed to me to be appropriate. It suggests a definite and familiar clinical syndrome which seems to require a designation. "Cardiac dyspnœa" includes much more, while "paroxysmal cardiac dyspnœa" is needlessly long, fails to suggest the violence of the seizure, and includes the major phases of Cheyne-Stokes breathing. Though there may be good reasons for insisting that the word "asthma" shall be confined to "a totally different clinical series," the term "cardiac asthma" has been adopted by Mackenzie and by other cardiologists, and is finding its way into the indices of the more recent text-books. It is convenient, everyone knows what it means, and, whether it is right or wrong, I think it has come to stay.

I am, Sir, yours faithfully,

Tunbridge Wells, Dec. 29th, 1923. CLAUDE WILSON.

AUTO-PYO-THERAPY.

To the Editor of THE LANCET.

SIR,—I could not give a summary of my investigations into auto-pyo-therapy [1] better than that which appeared in THE LANCET of Sept. 29th (p. 660), but I should like to add a few words to indicate the significance which I myself attach to these observations. Not only in the article with which you dealt but also in my first paper (German Assoc. of Surgery, 1922; see Arch. f. klin. Chir. Kongressband, 1922, 121, p. 33) I laid stress on the fact that the importance of my findings lay not in the practical successes (the knife is a very good remedy for suppurations) but in the two theoretical inferences: (1) that subcutaneous injections of untreated "native" pus containing virulent germs cause no progressive infiltration, phlegmon, or sepsis in the same patient; (2) that an established purulent process *can be healed* by such injections without any operative opening of the focus. The old advice "ubi pus, ibi evacua" expressed dogmatically the idea that pus must be the noxious principle of inflammation, and that complete and rapid evacuation was therefore the only real treatment. But practice showed that the application of this axiom could lead us astray; for instance, the much-discussed treatment of peritonitis by large "heroic" laparotomies, cross-incisions (Israel), &c., had very bad results, and supporters of "closed" treatment of peritonitis increase from day to day. Early thoracotomy in empyema carries a notorious risk; Renaud affirms that only such patients recover whose illness was recognised late, so that operation was retarded. Even nowadays the advisability of radical operation in acute osteomyelitis is problematical, being denied

[1] Deut. med. Wochenschrift, August 31st, 1923.

by many authors. The fact becomes increasingly accepted that a kind of preparatory process of the organism must occur in our work. But it is also well known that sometimes *perfect healing* can result from the action of the organism itself. Big peri-appendicular abscesses can be healed without incision or perforation so perfectly that hardly any trace is found on the occasion of a secondary appendectomy. It was my purpose to activate and increase these powers in every case of purulent inflammation. I sought a stimulus or protoplasm activator which might surpass other vaccine treatments as regards the specialty, the intensity, and the multifariousness of its effect, and I think I have found it in the pus itself. In the pus there are found the material and products both of the bacteria and of the cells of the body. The results obtained in my own cases were very good, but I yield to no one in my desire for thorough re-examinations, rigorous choice of cases, and strict indications. For the present I wish this method to be neither a substitute nor a successor to the old, well-proved surgical treatment.

I am, Sir, yours faithfully,

Budapest, Dec. 15th, 1923. DR. ENDRE MAKAI.

HAD OLIVER GOLDSMITH A MEDICAL DEGREE?

To the Editor of THE LANCET.

SIR,—Where Goldsmith graduated as a bachelor in medicine has long been in dispute, but that dispute cannot be settled by the statement of Mr. Justice Samuels in the note on pages 75–76 of his interesting work, "The Early Life, Correspondence, and Writings of the Rt. Hon. Edmund Burke, LL.D." (Cambridge, 1923). In the note referred to Mr. Justice Samuels says: "Goldsmith's medical degree was not, as has been the tradition, obtained at Leyden or Louvain, but at Dublin, where the degree of bachelor of medicine was granted to him, and that Oxford conferred the M.B. *ad eundem* on him on February 17, 1769." The evidence in support of this statement is contained in the following extract from *Jackson's Oxford Journal* for Saturday, Feb. 18th, 1769. "Yesterday Oliver Goldsmith, Esqr., Bachelor of Physic of the University of Dublin, author of 'The Traveller a Poem,' of 'The Present State of Polite Learning in Europe,' and several other learned and ingenious performances, was admitted in Congregation to the same Degree in this University."

Goldsmith entered Trinity College, Dublin, on June 11th, 1745, and he graduated Bachelor in Arts on Feb. 27th, 1749, so that according to the Statutes of the University he would not be eligible for a degree in medicine till 1752. In the latter part of that year Goldsmith left Ireland and entered on the study of medicine in the University of Edinburgh, and two years later he went abroad to complete his education. The first time that Goldsmith is recorded as having described himself as M.B. is on March 31st, 1763, in an agreement, written in his own hand, with James Dodsley. In the interval between his setting out for Edinburgh in the autumn of 1752 and March 31st, 1763, there is no evidence that Goldsmith was in Dublin, and consequently, if he was examined for the degree of M.B. in the University of Dublin, that examination must have been in the year 1752. At that time the examinations for medical degrees in the University were conducted by the College of Physicians, and the names of those examined are recorded in the minutes of that College. In neither the minutes of the College of Physicians nor in those of the Board of Trinity College is there any reference to such an examination of Goldsmith.

If Goldsmith were admitted M.B. by the University of Dublin between 1753 and 1763, that degree must have been conferred in absentia, and without previous examination. On Feb. 5th, 1761, the President and Fellows of the College of Physicians declined to take any further part in the examination of candidates for the medical degrees of the University of Dublin, on the ground that the Board of Trinity College had admitted a person to the degrees of M.B. and M.D. though the College of Physicians had refused to examine him. Had the Board granted a degree in absentia and without examination to Oliver Goldsmith, that fact would probably have been mentioned to strengthen the case of the College of Physicians, but it was not. On May 16th, 1761, the Board of Trinity College unanimously resolved "That a previous examination of the candidates for degrees in medicine is absolutely essential," and, in consequence of the attitude of the Fellows of the College of Physicians, that "The Prælectors in Chymistry and Anatomy, together with the Professor of Medicine," were to conduct the examinations. The Prælector in Anatomy, Dr. Robert Robinson, who, as a Fellow of the College of Physicians, refused to take part in the examinations, was on June 29th dismissed from the office. In view of this resolution it is unlikely that the Board of Trinity College would have admitted, in absentia and without examination, Oliver Goldsmith to the degree of M.B. during the interval between 1761 and March 31st, 1763. It is, of course, possible that this was done, but it is unlikely, and without further evidence in support of it the case for Goldsmith's medical degree in the University of Dublin must be regarded as not proven.

I am, Sir, yours faithfully,

T. PERCY C. KIRKPATRICK,
Registrar, Royal College of Physicians of Ireland.

Dublin, Dec. 23rd, 1923.

WHITE MEN AND WORK IN THE TROPICS.

To the Editor of THE LANCET.

SIR,—In the *Archiv für Schiffs- und Tropen-Hygiene* (vol. xxvii., 5, p. 177) Dr. H. W. Knipping, of the Physiological Institute of the University of Hamburg, discusses the heat regulation of the human body in the tropics, inquiring whether white workmen, who suffer more often from heat-stroke than do natives, have greater difficulty than these others in adjusting themselves to tropical conditions. He shows that after numerous investigations by many men, there has been found no material difference in the heat-regulating mechanisms of these two classes, though coloured men have probably more sweat glands and larger cutaneous capillaries. The great reducer of temperature is perspiration, but that does not help as it might unless there is a sufficient current of dry enough air to evaporate the sweat secreted. As an example of the absolutely worst place in which to work in the tropics he takes a boiler-room (furnace-room, stoke-hold) in the Red Sea, and observes that there, with a temperature of 49° C. (120° F.) and a relative humidity of 88 per cent., men drank, in a four hours' watch, 5 litres, and that 2½ litres were to be evaporated through lungs and skin. Probably this means that 2½ litres of urine were passed, but that is not directly stated. To evaporate this 2½ litres, 1343 calories are claimed as necessary, and 300–400 cubic metres (10,000–14,000 cub. ft.) of air at this humidity to carry this vapour away. There was not enough air supplied, so the men's temperature rose; sometimes he found it as high as 38·8° C. (101·8° F.). Even here it was not men in good health who took care of themselves who got heat-stroke. Coloured firemen escape because they do not work so hard; they do rarely more than half a white man's task. Their modest demands on life are satisfied with less exertion. The white man trying to work in the tropics as he could and did in the temperate zone exposes himself to a great risk. Dr. Knipping reaches the conclusion that, for any climate, the maximum safe output of work is a function of the drying power of the air, in relation to the temperature of the atmosphere and its rate of movement.

A very important question in reference to colonisation is raised by this communication.

I am, Sir, yours faithfully,

R.N.

Obituary.

LAURISTON ELGIE SHAW, M.D., F.R.C.P. LOND.

Dr. L. E. Shaw, consulting physician to Guy's Hospital and to the Royal Bucks Hospital, died at his residence in Weybridge on Christmas Day last, aged 64. He was born in 1859, a son of Dr. Archibald Shaw, of St. Leonards, and received his medical education at Guy's Hospital, where he obtained the gold medal in medicine. In 1881 he obtained the M.R.C.S. Eng.; the following year he graduated in medicine at the University of London, and proceeded to the M.D. in 1883. About this time Dr. Shaw joined the staff of Guy's Hospital and rapidly won his way to promotion, throwing himself with enthusiasm into improving the organisation and teaching in the medical school. He filled the offices of curator of the museum, medical registrar, and teacher of pathology, and later was appointed lecturer in practical biology and assistant physician. In due course he became full physician and lecturer on medicine, posts which he held until his resignation in 1919. He also held office as Dean of the Medical School of Guy's Hospital and was for a time assistant physician at the City of London Chest Hospital.

As a teacher Dr. Shaw was very popular; students greatly appreciated the trouble he took with them, and many owe a sound knowledge of clinical medicine to him. He had a way of bringing out the essential feature of any case, and he not only taught from his own knowledge but criticised the current doctrines fairly, so as to prevent his listeners from pursuing will-o'-the-wisps; he stimulated discussion among those at the bedside and would often ask one of his colleagues to come and discuss a difficult case with him before an assemblage of students. With the help of his friend, Sir Cooper Perry, he wrote a long paper in the Guy's Hospital *Reports* on diseases of the duodenum, which contained the experience of Guy's Hospital ever since post-mortem records had been kept—a paper which has become classical.

Lauriston Shaw became keenly interested in medical politics at an early stage of his career, and associated himself with the British Medical Association. He was elected President of the Metropolitan Counties Branch of the Association in 1911, and was for some years chairman of the Ethical Committee. He took an active part in framing the provisions of the National Health Insurance Act, and held the responsible position of treasurer of the Panel Committee for London from its inception. To this post he was unanimously re-elected year by year, until ill-health compelled his retirement, much to his own regret, in October, 1923. At the same time he resigned his membership of the London Insurance Committee, on which body he had been an appointed representative of the profession.

In appreciation of his unselfish labours for the betterment of medical administration, his colleague, Dr. H. H. Mills, writes: "I was intimately associated with Dr. Shaw during the difficult months immediately before and after the establishment of the National Insurance Act. During that stormy time he remained calm and unperturbed. He was a man of vision and high ideals, which enabled him to take an optimistic view, with never a doubt as to the ultimate success of the great experiment. His calm counsel was invaluable, and his ability in seeing the question from all points of view was remarkable. This enabled him to adjust many difficulties and to make progress even when clashing interests threatened unavoidable rupture. His statesmanlike work was invaluable, and he lived to see the undoubted success of the scheme for which he sacrificed so much."

From the time of his nomination to a seat on the Metropolitan Asylums Board by the Ministry of Health in 1915 until last summer Dr. Shaw had devoted himself unsparingly to the furtherance of the Board's work, and especially to the advancement of its medical status. His knowledge of medical subjects, combined with a capacity for rapidly marshalling facts and a remarkable facility of expression, made him an ideal chairman of the important special and medical subcommittee of the infectious hospitals section. He had a great belief in the potentiality of the Board as an educational organisation, and realised the wealth of material for teaching and research collected in its numerous and varied institutions. He was largely instrumental in instituting both the scientific advisory committee, a body of experts in various branches of medical and allied sciences nominated at the request of the Board by the Medical Research Committee, and also the subcommittee concerned with the coördination of the whole medical and nursing arrangements.

Of his personal qualities "W. H.-W." writes: "Perhaps his most obvious characteristic was his honesty. However he might differ from his colleagues in some matter of policy, they always knew that he advocated a particular course because he believed that it was the best not for himself but for the general good. Nevertheless, he recognised that others might with reason hold contrary opinions; he never got angry, and was always fair to and willing to listen to his opponents. He made an admirable chairman, in which position he exercised a sweet reasonableness and quiet humour that could convert what might have been a stormy meeting into a peaceful, harmonious, and useful discussion."

As a loyal friend, as a sound clinician, and as a man of vision his loss is a sore one to the ranks of medicine. Ever courageous, Shaw carried out his ideals fearlessly in spite of ill-health or adverse criticism, for, as he once admitted, his work in behalf of the National Health Insurance from 1911 to 1913 made him so unpopular that for a time nearly every avenue of activity was closed to him. Notwithstanding all he persevered, and his work during the last ten years in the interests of the community first and of the profession second, won him admiration and respect.

SIR LAMBERT HEPENSTAL ORMSBY, M.D. DUB., F.R.C.S.I.

Sir Lambert H. Ormsby, past President of the Royal College of Surgeons in Ireland, whose death we have already announced, was born in 1850. He had been ill for some weeks past, but had been confined to his bed for only a few days.

Lambert Ormsby, though of Irish descent, was born in Auckland, N.Z., his father, George Owen Ormsby, C.E., being surveyor-general of New Zealand. The son came to Ireland at an early age, and entering the Royal College of Surgeons as an apprentice of Mr. (later Sir) George Porter, had passed all examinations for his licence at the age of 19. Having received the licence he entered Trinity College, Dublin, and subsequently gained the medical degrees of that institution, M.B. in 1874 and M.D. in 1877. He was admitted a Fellow of the Royal College of Surgeons in Ireland in 1875. Meanwhile, at the age of 21, he was elected surgeon to the Meath Hospital, the duties of which post he continued to perform up to his death. From 1902 to 1904 he was President of the Royal College of Surgeons, and on the death of Sir Charles Cameron a few years ago he was elected honorary secretary of the College. During his tenure of office as President, in 1903, Ormsby had the honour of knighthood conferred upon him. Early in his surgical career he became interested in the diseases of children, and was for many years senior surgeon to the National Children's Hospital, Dublin, which in 1876 he had founded as the National Orthopædic and Children's Hospital. His work there is embodied in two important volumes on "Deformities of the Human Body" and on the "Diseases Peculiar to Children." His name is recorded in the history of anæsthetics by his invention of an ether inhaler, which still has its uses, though lacking the niceties of later modifications. He also invented a new form of pile clamp and an aseptic glass drainage-tube. A

description of his new form of rectal speculum was published in THE LANCET, 1905, vol. ii., p. 362. He wrote various papers on surgical subjects, and also a "History of the Meath Hospital." For many years he interested himself in public life, and was an active magistrate and Poor-law guardian. He acted as chairman of the Association for the Housing of the Very Poor in Dublin, and played a prominent part in many philanthropic movements. In 1885 he founded the Dublin Red Cross Nursing Sisters' Home and Training School for Nurses, an institution to which he devoted his constant care. He was consulting surgeon to the Drummond Military Schools, Chapelizod, and honorary consulting surgeon to the Dublin branch of the Institute of Journalists. He was also a member of the Board of Superintendence of Dublin Hospitals, and governor of the Government Lock Hospital.

Sir Lambert Ormsby was a man of strong personality. In 1906, when senior surgeon to the Meath Hospital and the County of Dublin Infirmary, he voiced the grievances of the Naval Medical Service to his students, urging them, in effect, not to enter the service in order that the authorities might be moved to remedy what he considered obvious defects in the system. Although several of his statements were challenged, a committee was formed in 1911 under Admiral Sir John Duncan to inquire into the prevailing conditions, and certain improvements resulted, including the establishment of a naval medical school. In March, 1915, he was appointed honorary consulting surgeon to the New Zealand Expeditionary Force, with the rank of Lieut.-Colonel.

His first wife, daughter of Mr. John Dickinson, died in 1911, leaving a daughter and a son, Colonel G. J. A. Ormsby, D.S.O., R.A.M.C., who distinguished himself in the war. Sir Lambert Ormsby married, secondly, in 1921, Geraldine Matthews, R.R.C., O.B.E.

SIR NAPIER BURNETT, K.B.E., M.D. GLASG., F.R.C.S. & P. EDIN.

Sir Napier Burnett, who died on Christmas Day at the age of 51 years, will be remembered as a real friend to the voluntary hospital principle. He was the youngest son of James Burnett, of Fraserburgh, and was educated at the Universities of Edinburgh and Glasgow, qualifying in medicine at the latter in 1894. He practised in Milnathort for a couple of years, after which he moved to Blackburn, where he built up a large connexion. But general practice did not satisfy him completely and he took up the study of obstetrics and gynæcology at Dublin and Manchester with a view of consulting work in Newcastle-upon-Tyne. In 1905, after taking the F.R.C.S. Edin., he joined the staff of the Women's Hospital in Newcastle and in 1911–12 he was president of the Newcastle Clinical Society, playing an active part in that society's work, especially in the founding of a journal of its Transactions. He was also an original member and part founder of the Pathological Club in Newcastle. His writings at this time included a study of obstetrics in relation to allied sciences, and papers on placenta prævia, *B. coli* infection of the urinary tract in pregnancy, and chorio-angioma of the placenta, the last in association with Prof. Stuart McDonald.

When war broke out in 1914 Burnett was already regarded as something of an authority on hospital administration, of which he had been for years a keen but friendly critic. With Prof. Rutherford Morison he organised the Northumberland War Hospital and was an active member of its surgical staff until he was called to larger things. It was a happy inspiration which led the War Office to invite Burnett to examine war hospitals as to their working efficiency, and he threw himself with much zeal into his duties as chairman of the Economic Committee of the Army Medical Department. When this came to an end he was asked by Sir Arthur Stanley to direct the Hospital Service Department of the Red Cross, which was then undertaking a survey of hospital finance and shortly after he became chief executive officer of the Joint Council, as well as adviser to the Joint War Committee on the administration of the balance of funds to ex-Service men. On behalf of the British Red Cross Society he attended the meetings at Geneva of the League of Red Cross Societies and he also represented the Government at the disposal of Red Cross stock left at Constantinople. Four annual reports on the Voluntary Hospitals in Great Britain (excluding London) issued from his pen, the last of these in July, 1923. These reports are much more than statistical summaries, they are a record of the recovery of the voluntary hospitals from the trough of depression, amounting almost to bankruptcy, in which the war left them. Burnett recognised the deepening interest of the public in the voluntary movement. It may seem strange that little in his professional life previous to the war had foreshadowed the powers which were in the man, but those who knew Burnett well had always seen him as one who touched life at many points and who brightened and quickened what he touched. No doubt among professional men there are many potential administrators whose gifts are never put to the test; the opportunity came to Burnett and did not find him wanting. His balance and persistency, his gift of sound judgment and foresight, his faculty of mastering experiences by a steady sweeping progress of comprehension brought him unerringly to his goal, while the fact that he never stooped to subterfuge or feared the judgment of his fellows brought him the respect even of those who differed from him.

In civic life Burnett was a justice of the peace for the City of Newcastle and sat regularly on the local bench. He became a member of the Newcastle City Council for St. Thomas's Ward, where he was succeeded by his friend Dr. R. W. Simpson when he left for London. In politics a Liberal, in religion a Presbyterian, his standard of public duty was high. It was in large measure his sympathy with the poor, and his acquaintance with their struggles when afflicted with illness, that induced him to work for hospital coördination and efficiency. His own bent was against State control, and while he worked unceasingly to set up sound finance and administration he always hoped that the civil hospitals might remain apart from departmental management. The success of this achievement—if indeed it has been achieved—lies largely at his door.

Sir Napier Burnett married Jane, daughter of the late George McCoull, of Ovington House, Northumberland. He is survived by his widow and four daughters, for whom great sympathy is felt at their untimely loss.

ERNEST ROCK STREETEN, M.R.C.S. ENG.

Dr. E. R. Streeten died on Dec. 17th, 1923, at Bexhill-on-Sea, aged 57 years, after a long period of ill-health. He was a student at St. George's Hospital and qualified M.R.C.S. Eng. and L.R.C.P. Lond. in 1890. After holding an appointment at the Royal India Asylum as assistant medical officer and working as locum and assistant for some time, he bought a practice in Barnsbury, London, N., and remained there for 23 years—until 1918. In that year he had a serious breakdown in health, and owing to cardiac trouble, was compelled to retire from practice. He settled in Ventnor, Isle of Wight, but removed from there to Bexhill-on-Sea early in 1923.

He leaves a widow and one son, aged 15, who is being educated at Epsom College.

A HOVE CENTENARIAN.—On Dec. 27th last Mrs. Dill, mother of Dr. John Gordon Dill, of Brunswick-square, Hove, celebrated her hundredth birthday. She is the daughter of General Sir Charles Wale, K.C.B., and granddaughter of Mr. Thomas Wale, of Little Shelford, Cambridgeshire, who was born in 1701, the three lives thus covering the span of 222 years. Mrs. Dill was married to the late Dr. Richard Dill, of Regency-square, Brighton, in 1856; there were six children of the marriage, Dr. Gordon Dill being the eldest and only surviving son.

Medical News.

UNIVERSITY OF ST. ANDREWS.—At examinations held recently the following candidates passed in the subjects indicated :—

SECOND EXAMINATION FOR DIPLOMA IN PUBLIC HEALTH.
Sanitation and Epidemiology.—James Lamberton, William L. Tullis, and Frances H. Watson.
Sanitary Law and Vital Statistics.—James Lamberton, Isobel M. Mansis, William L. Tullis, and Frances H. Watson.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated :—

Surgery.—D. Dimitrijevitch, Oxford and St. Mary's Hosp.; H. S. Edwards, St. George's Hosp.; and S. Snelson, Manchester.
Medicine.—H. J. Powell, St. Mary's Hosp.; and D. G. Robinson, Guy's and Charing Cross Hosps.
Forensic Medicine.—P. V. Casling, St. Mary's Hosp.; H. T. Chiswell, Guy's Hosp.; H. J. Powell, St. Mary's Hosp.; R. Schofield, Guy's Hosp.; and J. B. Sweet, Glasgow.
Midwifery.—F. H. Armanious, St. Thomas's Hosp.; C. J. Fox, St. Mary's Hosp.; and R. Norrie, St. Andrews University.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: D. Dimitrijevitch and C. J. Fox.

A THREE months' course of lectures and demonstrations in Hospital Administration will be given at the North-Western Hospital, Lawn-road, Hampstead, N.W. 3, by Dr. E. W. Goodall, on Mondays and Thursdays, at 4.30 P.M., and alternate Saturdays at 10.30 A.M., beginning on Jan. 7th.

DINNER TO SIR JOHN BLAND-SUTTON.—On Thursday, Jan. 24th, at 7.30 for 8 P.M., at the Hotel Victoria, Northumberland-avenue, W.C., a congratulatory dinner will be given by Middlesex Hospital colleagues and friends to Sir John Bland-Sutton, to mark the occasion of his election to the Presidency of the Royal College of Surgeons of England. Dr. W. Essex Wynter will preside.

CHELSEA CLINICAL SOCIETY.—A meeting of this Society was held in the Clubroom, St. George's Hospital, on Dec. 18th last. A discussion on the Manipulative Treatment of Joint Diseases was opened by Mr. Frank Romer, who also gave a demonstration of the methods employed by bone-setters. Dr. J. B. Mennell and Messrs. Duncan Fitzwilliams, Graeme Anderson, W. H. Trethowan, and B. Whitchurch Howell also took part in the discussion.

RONTGEN SOCIETY.—A general meeting will be held on Jan. 8th, at 8.15 P.M., in the British Institute of Radiology, 32, Welbeck-street, London, W. Dr. J. A. Crowther will read a paper on Studies in X Ray Production, and Mr. H. Moore will speak on the Quality of the X Rays Excited in Hot Cathode and in "Gas" Tubes by Various Types of Generators of High-Tension Current.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART.—A special two weeks' intensive course in cardiology will be held from Jan. 14th to 25th. In the mornings from 10 to 12.30 lectures and demonstrations will be given by Dr. B. T. Parsons-Smith, Dr. J. Strickland Goodall, Dr. John Parkinson, Dr. F. W. Price, Dr. R. O. Moon, and Sir Sydney Russell-Wells, M.P., and the afternoons will be devoted to ward demonstrations and out-patients. A selection of museum specimens, slides, &c., will be arranged in the laboratory and changed daily throughout the course. Further particulars may be obtained from the Dean, Dr. Parsons-Smith, at the hospital, Westmoreland-street, Marylebone, W. 1.

FUTURE OF LEEDS HOSPITALS.—In order to gain the interest of business and professional men in the schemes set on foot for raising more money for the maintenance of the local hospitals and other medical institutions a meeting was held on Dec. 17th at the Leeds Town Hall. Amongst other schemes the collieries in Yorkshire are to contribute on the basis of one farthing per ton of coal raised, and the miners one penny a week each; these together are calculated to realise about £15,000 a year. By other organisations of the business centre of the city it is hoped to raise £2000 a year. These sums, and much more, will be needed, as it is calculated that the deficit on this year's working of the General Infirmary will be between £25,000 and £30,000, while that on the Women's and Children's and Maternity Hospitals will be about £10,000. At the General Infirmary there is a list of 1200 to 1600 people awaiting admission for operations, and to open a new ward would cost between £4000 and £5000 a year. To-day the cost of maintaining the infirmary is £100,000 a year, and £30,000 to £35,000 to carry on the other Leeds hospitals, and for the convalescent homes between £6000 and £10,000 a year.

UNIVERSITY OF LONDON.—A course of three lectures on the Influence of Improved Town Planning and Housing in Public Health will be given by Prof. John Robertson, M.D., of Birmingham, at University College, Gower-street, W.C., on Jan. 18th, Feb. 1st and 15th, at 5 P.M. At the first lecture the chair will be taken by Prof. H. R. Kenwood. The lectures, which will be illustrated with lantern slides, are addressed to advanced students of the University and to others interested in the subject.

REMUNERATION OF INSURANCE PRACTITIONERS.—The Court of Inquiry into the remuneration of practitioners under the National Health Insurance Acts sits to-day (Friday) at the Ministry of Health, and again on Monday and Tuesday, in each case at 10.30 A.M. These meetings are open to the public and the press. The Minister of Health and the Secretary for Scotland have appointed Sir Gilbert Garnsey, K.B.E., to be a member of the Court, in succession to Sir Josiah Stamp, K.B.E., who is unable to serve owing to pressure of other business.

MAUDSLEY HOSPITAL.—The seventh course of lectures and practical courses of instruction for a diploma of psychological medicine will begin on Jan. 21st, 1924, when Sir Frederick Mott, F.R.S., will give the first of eight lectures on the Anatomy of the Nervous System at 2.30 P.M. On Jan. 24th Dr. H. Devine will start his series of eight lectures on Psychology, and on the 25th the first of eight lectures on the Physiology of the Nervous System will be delivered by Dr. F. Golla. Practical instruction and demonstrations will also be given in physiological chemistry and practical physiology. Arrangements for the second part of the course will be announced later. Further particulars may be obtained from the Director of the Pathological Laboratory, Maudsley Hospital, Denmark Hill, London, S.E.

FELLOWSHIP OF MEDICINE.—The North-East London Post-Graduate College is holding in association with the Fellowship of Medicine an intensive course at the Prince of Wales's General Hospital, Tottenham, N. 15, from Feb. 4th to 16th, 1924. It will include demonstrations of clinical methods and cases, lecture-demonstrations, and work in the general and special departments of the hospital. A special feature of the course will be the afternoon lectures at 4.30 P.M. These lectures will be free to general practitioners who are members of the North-East London Post-Graduate College, and to members of the Fellowship of Medicine. The names of the lecturers will be published later, and the complete syllabus will be available shortly. Application should be made to the Dean of the College, Mr. J. Bright Banister, 39, Harley-street, W. 1, or to the secretary to the Fellowship at the above address.

PANEL DOCTORS' £1000 PENALTY.—The report of the Ministry of Health upon the Tottington inquiry, which resulted in a fine of £1000 being imposed upon two medical men in respect of infringements of the Insurance Acts Regulations by charging fees to panel patients, came before the Lancashire Insurance Committee on Dec. 17th. A resolution was moved to request the Ministry to reduce the fine to £100, but only the mover and seconder voted for the resolution. The chairman said that the £1000 went to the Treasury.

CHINESE DOCTOR'S WELCOME IN JAPAN.—Recent signs of a rapprochement between China and Japan have included the enthusiastic welcome during his tour through Japan of Dr. Wu Lien-teh, the president of the National Medical Association of China. Dr. Wu is a Cambridge graduate, who has spent some time in France and Germany and holds many European honours. Now director and chief medical officer of the North Manchuria Plague Prevention Service, and one of the chief authorities on plague, Dr. Wu met important gatherings at Kioto, Tokyo, Osaka, and Nagasaki. At Kioto he spoke to his audience of 400 medical men and students in Mandarin, and specially urged the need in teaching centres of separating the subject of hygiene from the department of bacteriology or even pathology, on the plea that public health has become more important than the lives of individuals. He contrasted the difficulties of Eastern countries with those of Western, owing to differences in constitution and habits, and urged the need of a common standard for health matters in the East. In some centres he spoke in English, his remarks being translated into Japanese by Dr. Todyo. At the Medical Conference at Kagoshima he spoke for one and a half hours to 800 medical men, and dealt particularly with the research work done in Harbin during the past few years. He stated that he hoped that if part of the Boxer Indemnity was returned, as had been proposed, a portion of the money would be devoted to the establishment of a proper institution in China. Throughout his tour Dr. Wu was accorded a warm welcome.

DONATIONS AND BEQUESTS.—Mr. Elgin Needham, solicitor, Werneth, Oldham, by will left £1000 to the Oldham Royal Infirmary, £500 to the Oldham Mission, £100 to the Oldham Nursing Association, £300 to the Oldham Bluecoat School, and £100 to the Ellesmere (Salop) Cottage Hospital.—The late Mr. Walter Laurie, of Hawick, bequeathed £1000 to the Hawick Cottage Hospital, and £500 to the Jubilee Nursing Association. The New Year brought handsome contributions to 22 hospitals in Manchester and Salford from the Lord Mayor of Manchester Two Million Shillings Fund. The gifts ranged from £23,000 to £100, in accordance with the figures appearing in the report of the Joint Hospitals Committee. Some of the larger amounts and their allocations were: Royal Infirmary, £23,000; Children's Hospital, Pendlebury, £9854; Salford Royal Hospital, £8690; Ancoats Hospital, £6000; St. Mary's Hospital, £5355; Eye Hospital, £4743; Hospital for Consumption, £3000; Victoria Hospital, £2464; Hospital for Incurables, £2317; Northern Hospital, £2000; Dental Hospital, £1500.

WATER-SUPPLY OF HASTINGS.—Fourteen years ago, in November, 1909, the ratepayers of Hastings voiced their opposition to a Various Powers Bill to the extent of a majority of 4792 in a poll of 5908. One of the principal clauses in the Bill had reference to the safeguarding of the town's water-supply; during the summer of 1908 the consumption of water for nearly a month was in excess of that which could be obtained by day and night pumping. But the ratepayers' veto prevented anything being done. A cost of some £130,000 was then spoken of, but this sum will now greatly be exceeded in the proposed new Bill which the town council is formulating. In the years that have elapsed neighbouring bodies, both public and private, have been pegging out their watersheds, with the result that Hastings may now have to look as far away as the Eastbourne or Folkestone areas to obtain an adequate water-supply.

LIVERPOOL LOCAL MEDICAL AND PANEL COMMITTEE.—At a meeting of this Committee, held on Dec. 17th, 1923, it was resolved that:—

In view of the fact that the text of the proposed "Provisional Regulations" which become operative on the first of January next has not yet been submitted to Panel Committees, this Committee desires to enter the strongest possible protest against the present arbitrary method of imposing continued and extensive alterations to the Medical Regulations. The Committee wishes to point out that the Medical Regulations were entirely re-cast as recently as the first of January last, and that the profession is now faced with what is practically a new set of regulations. It is quite impossible for a practitioner in active practice to keep in touch with these successive alterations, and he only learns of their existence when he is summoned to appear before the Medical Service Subcommittee.

Four other paragraphs appended to the resolution affirmed the belief of the Committee that the present condition of panel practice may lead to the breakdown of the system.

ULSTER MEDICAL SOCIETY.—The annual dinner of the Society was held in the Medical Institute, Belfast, on Dec. 18th last. Prof. St. Clair Symmers presided, and 137 members and guests were present. The occasion was memorable by reason of the presence of His Grace the Governor of Northern Ireland, the Duke of Abercorn, K.P. There were also present as guests the Prime Minister of Northern Ireland, Sir James Craig; the Lord Chief Justice of Northern Ireland, Sir Denis Henry, K.C.; the Speaker of the House of Commons of Northern Ireland, Hon. Hugh O'Neill; Lord Justice Moore; the President of the Royal College of Surgeons in Ireland, Sir William Wheeler; Mr. Justice Wilson; and the President of the Northern Law Society, Mr. S. G. Crymble. In the course of the evening Sir William Whitla presented a loving cup to the Society. The function was one of the most successful and enjoyable in the history of the Society.

CHILD WELFARE WORK IN LIVERPOOL.—From funds provided by the Carnegie United Kingdom Trust, a central building has been erected to act as a coöperating unit for all agencies concerned in work for mothers and babies. It is also intended to act as a model welfare centre. It contains, besides consulting-rooms and lecture-rooms, two wards of six beds each, in order that children may be kept under observation. The site, gifted by the city, lies between the Royal Liverpool Children's Hospital and the site of the new Maternity Hospital, and should be symbolical of the new centre's work, the aim being to keep mother and child alike healthy and so prevent disease. The upkeep of the new institution falls upon the municipality, but a substantial grant will be received from the Ministry of Health. The building was declared open on Dec. 15th last by Miss Haldane, chairman of the Welfare Committee of the Carnegie Trust, who emphasised the prophylactic character of the work to be begun there in the new year, and appealed for the help of voluntary workers in the welfare movement.

THE RADIUM INSTITUTE.—Sir Malcolm Morris has been elected chairman of the Institute in the place of the late Sir Frederick Treves, and Sir Humphry Rolleston has joined the committee.

GLASGOW WESTERN INFIRMARY.—As the result of a contribution from the Hutton Malcolm Amateur Operatic Society, the Western Infirmary will be able to instal a high tension transformer for use in deep X ray therapy.

GLASGOW ROYAL HOSPITAL FOR SICK CHILDREN.—At this hospital, which comprises 270 beds, during the last year 5171 children were treated as in-patients. In the out-patient department and at the dispensary over a similar period 19,148 and 49,833 respectively were treated, while in the country branch 380 children received attention.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL.—The sixth series of post-graduate lectures to students and practitioners, at 5 P.M. on Thursdays, will be held from Jan. 10th to March 6th inclusive. On Jan. 10th Dr. T. G. Stevens will lecture on the Treatment of Labour Complicated by Generally Contracted Pelvis. On Jan. 17th Dr. C. H. Roberts will speak on Ante-Partum Hæmorrhage. On Jan. 24th Mr. Bright Banister will discuss the Late Manifestations of Puerperal Sepsis. Mr. Aleck Bourne will deal with Puerperal Insanity on Jan. 31st, and Mr. T. B. Davies with Acute Abdominal Pain in Pregnancy on Feb. 7th. On Feb. 14th Mr. L. C. Rivett will lecture on the Value of Antenatal Examination, and on Feb. 21st Mr. Clifford White on Delay in the Second Stage of Labour. Mr. L. G. Phillips will deal with Infant Feeding on Feb. 28th, and the terminal lecture on March 6th by Mr. W. Gilliatt will be on Eclampsia and its Treatment.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Jan. 8th.

MEDICINE
PATHOLOGY
THERAPEUTICS AND PHARMACOLOGY } at 4.30 P.M.

Joint Discussion:
On the Uses and Limits of Vaccine Therapy. To be opened by Sir Almroth Wright, Dr. A. P. Beddard, Sir William Leishman, Dr. W. Gordon, Dr. Norman McCaskie, Dr. R. Armstrong, and others.

MEDICINE
NEUROLOGY
OBSTETRICS AND GYNÆCOLOGY } at 8.30 P.M.
PSYCHIATRY
SURGERY

Joint Discussion:
On Post-operative and Puerperal Mental Disorders. The following will take part in the discussion: Sir Charters Symonds, Dr. James Collier, Mr. Aleck Bourne, and others.

Thursday, Jan. 10th.

NEUROLOGY: at 8 P.M. at the Hospital for Epilepsy and Paralysis, Maida Vale, W.
Clinical Meeting.

Friday, Jan. 11th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.)
Cases will be shown.

OPHTHALMOLOGY: at 8.30 P.M. (Cases at 8 P.M.)
Cases will be shown.
Papers:
Lieut.-Colonel Herbert: A Case of Very Chronic Sympathetic Ophthalmia.
Mr. Harrison Butler: The Practical Value of the Slit Lamp.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W. 1.
FRIDAY, Jan. 11th.—8.30 P.M., Dr. Gordon Holmes will open a discussion on the Examination of the Cerebro-spinal Fluid in Relation to the Diagnosis and Treatment of Neuro-syphilis. Dr. T. Grainger Stewart, Dr. Panton, and others will continue the discussion.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W. 1.
(Lectures, Jan. 7th to 12th.)
NORTH-EASTERN FEVER HOSPITAL.
WEDNESDAY and SATURDAY.—11 A.M., Dr. Frederic Thomson: Diagnosis and Treatment of the Acute Infectious Diseases.

ST. PETER'S HOSPITAL FOR STONE.
MONDAY.—2 P.M., Mr. Andrews: Injuries of the Urinary Organs.
TUESDAY.—2 P.M., Mr. Joly: Urinary Calculi and Calculous Disease.
WEDNESDAY.—2 P.M., Mr. Morson: Tumours of the Urinary Tract.
THURSDAY.—2 P.M., Mr. F. J. F. Barrington: Non-tuberculous Infections of the Urinary Tract.
FRIDAY.—2 P.M., Sir John Thomson-Walker: Urinary Obstruction.
SATURDAY.—2 P.M., Mr. Harkness: Urethritis in the Male.

THE INFANTS HOSPITAL.
2–3.30 P.M., Clinical Demonstration each day.
MONDAY.—4 P.M., Dr. E. Pritchard: Principles of Infant Dietetics.
TUESDAY.—4 P.M., Dr. D. Paterson: Infections of the Urinary Tract.
WEDNESDAY.—4 P.M., Dr. Mackay: Cerebro-spinal Meningitis.
THURSDAY.—4 P.M., Dr. V. Deane: The Teeth of Infants.
FRIDAY.—2 P.M., Round-Table Clinical Consultation. 4 P.M., Dr. W. E. Robinson: Cough.

WEST-END HOSPITAL FOR NERVOUS DISEASES, at 73, Welbeck-street, W. 1.
MONDAY.—1.30 P.M., Dr. H. Campbell: Headache and other Sensory Disturbances.
WEDNESDAY.—5 P.M., Mr. L. Rea: The Eye in Nervous Disease.
FRIDAY.—5 P.M., Dr. C. Worster-Drought: Varieties of Neuro-syphilis.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Jan. 7th.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.
TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Banks-Davis: Diseases of Throat, Nose, and Ear.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Burnford: Medical Wards. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURES.
FRIDAY, Jan. 11th.—(At Whitworth-street West Branch.) 4.30 P.M., Dr. Fletcher Shaw: Some Clinical Points in Obstetrics.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Jan. 7th.—(At the Children's Hospital.) Mr. Thurstan Holland: X Ray Diagnosis.
TUESDAY.—(At the Southern Hospital.) Dr. Macalister: Intersexuality in Relation to Disease.
WEDNESDAY.—(At the Northern Hospital.) Mr. Simpson: Some Points in Abdominal Surgery.
THURSDAY.—(At the Stanley Hospital.) Mr. Courtenay Yorke: Ear, Nose and Throat Cases.
FRIDAY.—(At the Royal Infirmary.) Mr. Jeans: Urinary Surgical Cases.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Jan. 10th.—5 P.M., Dr. T. G. Stevens: The Treatment of Labour complicated by generally contracted pelvis.

Appointments.

BISSET, Dr. MARY, has been appointed Medical Officer for the County Council Schools at Brighton.
DUNSCOMBE, N. D., M.B., B.Ch., D.P.H. Camb., Casualty Officer at the East London Hospital for Children and Dispensary for Women, Shadwell.
GÖTHE, WERNER, M.R.C.S., L.R.C.P. Lond., Medical Officer in Charge of the Physico- and Electro-Therapeutic Department, Middlesex Hospital.

Vacancies.

For further information refer to the advertisement columns.

Barnet, Wellhouse Hospital.—Asst. Res. M.O. £150.
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Births, Marriages, and Deaths.

BIRTHS.

BRANDER.—On Dec. 28th, 1923, at Bexley, Kent, the wife of John Brander, M.D., of a son.
CUNNINGHAM.—On Dec. 28th, 1923, at Weymouth-street, W., the wife of J. F. Cunningham, O.B.E., F.R.C.S., of a son.
DONALDSON.—On Dec. 23rd, 1923, at Avenue-road, Hampstead, N.W., the wife of Dr. Malcolm Donaldson, of a son.
FAWSSETT.—On Dec. 27th, 1923, at Clarence House, Rhyl, North Wales, the wife of R. Shirley Fawssett, M.R.C.S., L.R.C.P., of a son.

MARRIAGES.

BOND—HILLCOAT.—On Dec. 27th, 1923, at St. Philip's Church, Leicester, Charles Eric Bond, M.B., to Janet Hillcoat.

DEATHS.

BURNETT.—On Christmas Day, 1923, at his residence, Hampstead, Sir Napier Burnett, K.B.E., M.D., aged 51.
FINLAY.—On Dec. 26th, 1923, at his residence in Jersey, Lieut.-Colonel William Finlay, R.A.M.C. (retired), aged 77.
PEDLER.—George Henry Pedler, M.R.C.S., L.R.C.P., L.S.A. (King's College and Hospital), at 80, Finchley-road (late of 235, Knightsbridge), on Dec. 23rd, 1923, aged 76.
SHAW.—On Christmas Day, 1923, at Oatlands Chase, Weybridge, Lauriston Elgie Shaw, M.D., F.R.C.P., Consulting Physician to Guy's Hospital, in his 65th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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A VISIT TO A LEPERS' COLONY.

BY SIR THOMAS OLIVER, M.D. GLASG., F.R.C.P. LOND.

WHEN in New Orleans in September last along with Dr. Oscar Dowling, President of the New Orleans Board of Health, and Judge Mawr, the District Attorney, I motored from the Southern States City 96 miles to the "leprosarium" at Carville. For nearly the whole length of the journey the road follows the course of the Mississippi, but the river is concealed from view by an unbroken line of high earthworks, or levees as they are called, raised to confine its unruly waters within limits. The road passes through corn and sugar-cane fields, beside rice beds, inundated with water syphoned from the Mississippi through large iron pipes, and here and there past a cotton field, but cotton plantations in Louisiana, compared with the sugar plantations, add little to the prosperity of the State.

On reaching the leprosarium we were received by Dr. Oswald E. Denny, a smart-looking officer, wearing the uniform of the Public Health Service, who had gained experience of the management and treatment of patients by having been in control of leprosy in the Philippine Islands, where, during the 25 years' administration of the islands by the United States, the number of cases of leprosy has fallen from 9000 to 3000.

Description of the Carville Institute.

The Carville Institute is built on the block and corridor system. On the left of the central or administrative building is a row of neat detached villas for the staff. The institution, which is run by the Federal Government, was established 28 years ago by the purchase of a large plantation. The central building used for administrative purposes was the residence of the planter. It is an elegant and well-finished wooden building, and gives evidence of having been a home of wealth and comfort. At present there is accommodation for 175 patients, but before the end of 1924 it is proposed to make room for 500. As an indication of the belief in the contagiousness of leprosy and dread of the disease, I may say that there was at the time of my visit in the institute a male patient who had committed serious crimes, and against whom the evidence was so strong that were he tried he would probably be convicted and the death penalty exacted. But he is a leper, and no judge will try him, nor will any criminal court open its doors to receive him; thus he remains in Carville untried.

There are separate buildings, to the right of the administrative block, for white and coloured patients of different sex, colour, and nationality. The Chinese, for example, are grouped together, as are the Greeks. From a hygienic and medical point of view the buildings are all that can be desired: the operating theatres, X ray rooms, chemical laboratories, and dispensaries are equipped with the latest and best materials.

On the staff are two consulting physicians, Drs. R. Hopkins and P. Howell, of New Orleans; Dr. Denny, the director; two resident physicians, Drs. H. K. Marshall and J. G. Wooley; and a dentist. Dr. Denny is also in charge of the bacteriological department, and directs and controls medical research. I was much impressed by the thoroughness with which everything is done and by the scrupulous attention to even the smallest hygienic details. In addition to an ordinary roadway between the extreme end of the wing of the official residences and the furthest ward to the right of the central block, there runs an elevated wooden platform extremely convenient in wet weather: a similar means of communication exists between the various buildings in which the patients are housed. The sleeping and living rooms of the latter are separated by corridors. The doors of the rooms are in their upper half occupied by a thin sheet of metallic gauze, useful alike for ventilation and as a preventive against mosquitoes. Of the culinary department and its annexes I can only speak in terms of the highest approbation. The lavatory and toilet system calls for a similar compliment.

The Condition of the Patients.

The patients are confined to the grounds, but these are spacious and open. Attempts to escape are seldom heard of. The patients with whom I conversed were, as far as circumstances permitted, satisfied with all that was being done for them. The worst types of facial leprosy I found among the Chinese. A few of the female patients were resting in their rooms, as some of them were the subjects of moderate pyrexial attacks, which frequently come on after midday, attended by ill-defined pains and gastro-intestinal disturbance.

The leprosarium is situated at a respectful distance from other human habitations, amid beautiful and varying surroundings, and everything is done by the medical staff and by the Roman Catholic chaplain, Father Keenan, with his 18 years of service, to make the enforced incarceration as pleasant and as little irksome as possible to the inmates. The latest addition in this direction is a brass band, which did its best to give us a kindly welcome.

To Dr. and Mrs. Denny I take this opportunity of thanking them for the sincerity of their reception and the warmth of their hospitality, and in this I include the other members of the staff.

Newcastle-upon-Tyne.

A SHORT-CIRCUITING OPERATION FOR INTESTINAL STASIS.

Dr. J. C. Watt, of the West African Medical Staff, has published in pamphlet form a study of Intestinal Stasis (London: John Bale, Sons and Danielsson), based upon the teachings of such observers as Panaroli (1654), O'Beirne (1833), Metchnikoff, and Arbuthnot Lane. He holds that intestinal intoxication is a more potent factor in producing degeneration of arterial walls than even the special syphilitic poisons; that it is usually impossible completely to clean out a relaxed bowel; and that the severer degrees of constipation are the most potent causes of many text-book diseases. Dr. Watt endeavours to combat the reluctance of the medical man to admit that any normal structure in the human body may be a source of disharmonious working of the rest. The operation which he proposed is to stitch the last part of the pelvic colon to the upper part of the rectum, afterwards crushing the intervening crest by means of forceps introduced through a transverse slit, and then dividing with scissors the crushed septum. Dr. Watt thinks that this operation would increase the power of impelling fæces at will into the rectum, and would lead to a call to stool three or four times a day. Holding, as he does, the view that stasis only occurs in the normal subject in the pelvic colon, the relief of stasis would necessarily follow. Dr. Watt does not offer experimental or clinical proof of the value of the suggested operation.

OLD ILLUSTRATED MEDICAL WORKS.

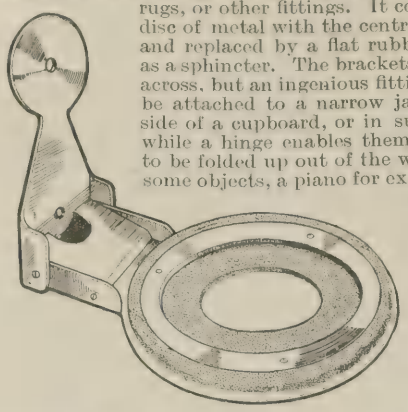
THE new Catalogue of the Internationaal Antiquariaat (Menno Hertzberger, No. 17, of 364 Singel, Amsterdam) records a number of interesting acquisitions now offered for sale to collectors and those interested in old medicine or the history of medicine. The second edition of Celsus, a small folio printed at Milan in 1481, is No. 100 in the Catalogue. This edition, by Pachel and Scinzenzeler, is far rarer than the first. It is finely illuminated, a beautiful copy, tall, clean, and "unwashed," in contemporary stamped binding. The book was not seen by Hain, and is now offered for 460 florins—i.e., something less than £46. Another exceedingly scarce edition offered for f. 325 is the "Herbarius Moguntinus," so-called because first printed at Mainz in 1484. The present edition, embodying the "De Virtutibus Herbarum," of Arnold de Villa Nova, was printed at Venice in 1509, and is one of the oldest herbals illustrated with woodcuts. The Augsburg "Hortus Sanitatis," of the year 1486, is an early printed book offered at the same price as the foregoing. This extremely scarce edition is remarkable for being one of the earliest illustrated books, and is a pioneer work in the history of botany and medicine. Hain does not mention it. John of Kethan's "De Medicina," of date 1517, is a later edition of the "Epiloga en Medicina." These editions were both printed at Seville, and the large woodcuts in the 1517 edition represent the processes of phlebotomy and the body of man and woman, while a smaller cut is a representation of two physicians with their medical boxes. The "Regimen Sanitatis," with commentary by Arnold de Villa Nova, is now offered. The date is circa 1492; it is an apparently unknown edition, the price being f. 160.

Among more modern works in this tempting catalogue we find the curious large atlas by Gautier D'Agoty, printed at Nancy in 1773, with title "Cours Complet d'Anatomie." It consists of 15 large folding plates, and is an early instance of printing in several colours. The two plates of the body of man and woman, which are nearly always lacking, are contained in this volume. The woman with a blue fillet in her hair may have been a live person known to D'Agoty, though she is displayed as if dissected. Old illustrated anatomies have, indeed, quite a human interest of their own, and the lady with the hairband might be paralleled by the well-known Albinus and Maclise illustrations, which are good examples of the figure-drawing of their day and doubtless, in many cases, represented living artists' models. In this connexion we may mention the portrait of a dead man on the reverse of the Cheselden Medal, presented in old days—if not now—at St. Thomas's Hospital. This

represented, as tradition averred, the most perfect corpse ever seen in the dissecting-room at that hospital. We are for the moment unaware if Choulant throws light on this subject. His "History and Bibliography of Anatomic Illustration in its Relation to Anatomic Science and the Graphic Arts" is now offered for f. 37.50. It is Frank's edition, printed at Chicago in 1921. Choulant published the original work in 1852.

A USEFUL BRACKET.

THE illustration shows a convenient bracket for firmly holding a tumbler of practically any size, a bottle, or other vessel, without danger of spilling the contents on cushions, rugs, or other fittings. It consists of a circular disc of metal with the central portion removed and replaced by a flat rubber ring which acts as a sphincter. The brackets measure 4½ inches across, but an ingenious fitting enables them to be attached to a narrow jamb of a door, the side of a cupboard, or in such-like situations, while a hinge enables them, when not in use, to be folded up out of the way. In the case of some objects, a piano for example, the brackets can be swung, when necessary, entirely out of sight. For invalids' chairs and ambulances these brackets should be of much utility, while for motor-cars, caravans, railway carriages, and indeed in any moving vehicle, the invention can be used with great convenience. The brackets are finished in lacquered brass, nickel plate, or oxidised metal, and are obtainable from the Burtons Patents Limited, 82, High-street, Bromley, Kent.



FINGER-PRINTS.

A WORK for the use of students of the finger-print method of identification has been written by Dr. H. Faulds,[1] who has long been known as a pioneer in this subject. In 13 short chapters it deals concisely with the history of the use of finger-prints for the purposes of identification in different parts of the world. Dr. Faulds, in 1886, after his return from Japan, where he made numerous experiments, urged the method on various authorities, including Scotland Yard, and in 1901 Lord Belper's committee recommended the adoption of the method in England and Wales, which took place in July of that year. Since that time not only the patterns formed by ridges and furrows have been studied and classified, but also the pores of the fingers and of the hand and body generally. An advocate of the newest method of poroscopy is Mr. Locard, the police expert of Lyons, who has emphasised that the permanent location of the pores gives proof of personal identity. Dr. Faulds mentions select methods and the necessary chemicals and dusting powders for bringing to view marks on black or white surfaces and objects transparent or opaque, and includes a glossary of terms and several illustrations. These include portraits in the puzzling case of the two American negroes, both named William West, who although unrelated to each other were remarkably alike in almost every detail except finger-prints, which alone saved one from being charged with the offences of the other.

COLONIAL HEALTH REPORTS.

Basutoland.

A CENSUS was taken on May 31st, 1921. The native population was returned as 495,937, exclusive of 17,141 absentees. Females were in the majority by over 50,000. The number of persons to the square mile was 48·30, as against 33·78 in 1904 and 38·97 in 1911. Europeans numbered 1603, as compared with 895 in 1904 and 1396 in 1911. Maseru, the capital and largest town, had a population of 1890 natives and 399 Europeans. The medical work of the territory continues to increase. During 1922, 42,528 patients were treated in the hospitals, and 1207 major and 1008 minor operations were performed. The cry is for more medical men, but in the present financial position of the country (writes Mr. R. B. M. Smith, the Government Secretary) it is not possible to provide them. The medical needs of the country are attended to by ten Government medical officers, two of whom are on specialist duty at the Leper Settlement, and five general practitioners, three of whom are paid district surgeons' fees for attendance at Butha Buthe, Teyateyaneng, and Mokhotlong camps. The missionaries are allowed to dispense simple remedies, but even with their help it cannot be said that the needs of the people are adequately met, though the work done with the Government's limited resources compares favourably with that of other countries. The distribution of free remedies for syphilis continues, and the missionaries who assist in this report most satisfactory results. Typhus fever has become endemic and outbreaks have been reported from every district in the country; 402 cases with 70 deaths were notified by the medical officers. The disease is of a mild nature, and many cases go unreported. It has been found most difficult to arouse the people to a sense of the gravity of the matter, but new regulations are being framed with a view to ensuring prompt notification, disinfestation, and quarantine. Small-pox was reported in all the districts except Maseru. The outbreaks were limited in extent except in Mohale's Hoek; there were in all 421 cases with 46 deaths. Influenza was fairly prevalent, 530 cases with two deaths being recorded. There were 77 cases of pneumonia with six deaths. Dysentery caused two deaths out of 89 cases. The dysentery is of the bacillary variety; amœbic or tropical dysentery is never seen except as an importation. Four cases of cerebro-spinal fever were recorded. The population of the Leper Institution on Dec. 31st, 1922, was 479 (220 males and 259 females); 87 new patients were admitted. It was noted that many were in the early stages of the disease, which is a sign that the objects and benefits of the institution are being appreciated by the people. A number came voluntarily to get admission; ten deserters were readmitted, and, from reports received, there are very few at large now. Five patients deserted during the year—by far the smallest number of deserters on record. All of them were returned promptly by their chiefs or their people, and this has had an excellent effect in the compounds. There were 68 deaths, of which 12 were due to influenza. Treatment with sodium morrhuate and the ethyl esters of the chaulmoogric acid series is being vigorously pushed and the good results obtained are expected to be continued. Improvements are being constantly made in the buildings and precincts of the compounds. Tree planting continues, and the orchards begun last year give promise of being very useful; it has been noted that fresh fruit, besides preventing scurvy, has a beneficial effect in leprosy, no doubt due to vitamin C. Dr. E. C. Long, C.M.G., principal medical officer, went on retirement on Dec. 31st, 1922, after over 32 years' service in the territory. He was succeeded by Dr. N. M. Macfarlane, deputy principal medical officer and superintendent of the Leper Settlement.

Grenada.

Mr. Herbert Ferguson, Colonial Secretary, in his report for 1922, says: "The colony, including the island of Carriacou, has a comparatively low death-rate, especially among adults, and health conditions are generally good. The death-rate for the year was 18·8 per 1000. Intestinal diseases, due to insufficient and improper feeding, are the cause of most of the deaths of children, and although remedial measures are being carried out by the Government and the District Boards, the death-rate among children is high. Of the total deaths 42·6 were of children below the age of 5 years. The death-rate of adults in proportion to the population above 5 years of age is considerably reduced, and, while not so low as in European countries, compares more favourably with the adult death-rate in temperate zones than the total death-rate indicates. Diarrhœa and enteritis caused 329 deaths (4·8 per 1000 of the population), dysentery 83 (1·2 per 1000), and malaria 83 (1·2 per 1000). There is a pipe-borne water service in all the parishes of the island except St. David's, the latter being supplied with numerous protected springs and streams. Certain lands forming the catchment area of the water-supply of St. George's have been acquired by the Government in order to prevent pollution. The water-supply of the island of Carriacou is obtained from wells and from rain-water stored in cisterns. The climate of Grenada can be classed as excellent, especially from December to May, when it is delightful. The trade-winds are steadily prevalent during this period, but occasionally fail in the autumn months, which are somewhat damp and hot. The range of temperature is small and tends to make the climate equable and healthy. The thermometer seldom reaches 90° F. in the shade, or drops below 70°, and these occasions occur so rarely that they are specially recorded in the meteorological notes of the year. The highest temperature in 1922 was 90° and the lowest 68°. The mean of maximum temperatures was 83° and the mean of minimum 73°. The rainfall varies according to altitude.

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[1] A Manual of Practical Dactylography. By Dr. Henry Faulds. London: Police Review Publishing Co., Ltd., 8, Red Lion-square, W.C. Pp. 68. 2s.

WE have received from the Laboratory of the Products "Usines du Rhone," 21, Rue Jean Goujon, Paris (8e) (Distributing Agents: Messrs. Dick, Coates and Co., 41, Great Tower-street, London, E.C. 3), a useful desk-block calendar for 1924, with a page for each day, on the well-known continental loose-leaf principle, on which reference to future or past dates is equally prompt and easy.

An Address
ON
TYPES OF GLYCOSURIA AND THEIR TREATMENT.

Delivered before the Manchester Medical Society, on Dec. 5th, 1923,

BY W. LANGDON BROWN, M.D. CAMB., F.R.C.P. LOND.,
PHYSICIAN, ST. BARTHOLOMEW'S HOSPITAL.

ALTHOUGH carbohydrate forms more than 70 per cent. of our ordinary diet it seldom constitutes more than 1 per cent. of our body-weight. This simple consideration alone shows that it must be the most easily metabolised of the foodstuffs, and it would naturally lead us to expect that when the process of metabolism is disturbed it will show itself particularly in respect of carbohydrate. That true diabetes implies a great deal more than a mere disturbance of carbohydrate metabolism is easily shown by the fact that if the total amount of food be sufficiently reduced glycosuria will cease, but that addition of too much protein and fat to the diet will cause its return without giving any carbohydrate at all. Again, the culmination of diabetes in coma is not directly due to the sugar at all, but chiefly to disturbance of fat metabolism, though protein and even inorganic salts are also involved. Diabetes is a disease characterised by an exaggerated katabolism, which shows itself first, and most obviously, in respect of that foodstuff which is ordinarily most abundantly ingested and yet forms the smallest part of the bodily tissues.

THE LIMIT OF SUGAR ASSIMILATION.

There is a limit to the amount of sugar which anyone can assimilate, but this limit is high enough for all ordinary needs. A normal individual has to take ¼ per cent. of his body-weight, which means as much as 150 to 200 g. (5 to 7 oz.) of dextrose at one time before any will appear in the urine, but no amount of starch should cause glycosuria because the time taken in its digestion prevents the blood from being flooded with sugar. While the ingestion of sugar may therefore be followed by glycosuria without implying the existence of diabetes, Naunyn declared that anyone passing sugar after even a free ingestion of starch is a potential diabetic. Before accepting that statement without modification, we must consider the mechanism by which the body attempts to compensate for an impaired power to assimilate sugar.

(*a*) It may store more than usual in the more stable form of fat. As von Noorden showed, some cases of obesity merely amount to latent glycosuria. The escape of a valuable foodstuff is thus avoided, but like all pathological substitutes for a physiological method, it is an inferior one. It adds to the dead weight of the body, making activity more difficult, while its complete oxidation makes a greater demand on the already over-taxed energies. Clearly, there must be a limit to this deposit of fat and when this is reached some of the sugar overflows into the urine.

(*b*) The body may raise the threshold for sugar. Normally, the blood contains 0·1 per cent. of sugar. About 20 minutes after a meal containing sugar this begins to rise and may reach about 0·15 to 0·17 per cent., falling again after an hour or more. If this figure is exceeded some sugar will usually appear in the urine. But when sugar metabolism has been impaired for some time the blood-sugar will rise and yet no sugar need appear in the urine. Many treated diabetics may show no glycosuria with blood-sugar as high as 0·25 per cent., a figure at which the normal individual would inevitably excrete sugar.

Here again the pathological compensation is an imperfect one. Whereas, the normal 0·1 per cent. of sugar appears to be in colloid combination, amounts above this appear to be in simple solution—i.e., they act as crystalloids. In this form they raise the osmotic pressure of the blood and disturb the equilibrium of the tissue fluids. Several of the symptoms are due to this. Thus the polyuria and the consequent thirst are mainly due to depletion of the body tissues of water by this rise of osmotic pressure in the blood. More serious results of the same cause are alterations in the translucency of the crystalline lens, causing diabetic cataract, and the changes in the sheaths of the nerves causing neuritis. The liability to septic infections and carbuncle are probably due in the same way to this excess of blood-sugar, which, while reducing the resistance of the tissues, provides an excellent pabulum for bacteria.

Hyperglycæmia and Glycosuria.

But recent experiments by Allen show that hyperglycæmia has an even more fundamental effect, for if it be continued the cell islets of the pancreas swell up, become vacuolated, and ultimately burst their basement membrane. I think this throws light on the old-standing controversy as to whether all cases of diabetes are pancreatic in origin. I am of opinion that they need not originate in the pancreas; but it is clear, wherever they start, if they keep up a sufficient level of hyperglycæmia they will ultimately affect the structure of the pancreas. Presumably the cell islets become exhausted in the attempt to deal with the excess of sugar in the blood, for Allen also showed that by controlling hyperglycæmia the cell islets showed some power of recovery. Since the kidney can interpose a barrier or threshold of varying height to the excretion of sugar, examination of the urine is not a satisfactory measure of the sugar of the blood. Glycosuria may occur without hyperglycæmia, while hyperglycæmia need not be followed by glycosuria. The point of interest in cases of disturbed carbohydrate metabolism has therefore shifted from the urine to the blood, and we can modify Naunyn's phrase as follows: *Anyone with a resting hyperglycæmia is a potential diabetic.* If anything this definition is not inclusive enough, as we shall see. But it excludes cases of renal glycosuria, which belongs to an entirely different category from all other forms of glycosuria, and which do not depend on a disturbance of metabolism at all.

Renal Glycosuria.

The name of *renal glycosuria* has been given on the analogy of the effect of phloridzin poisoning, which seems to act directly on the kidney, causing it to secrete sugar, even when the sugar in the blood has been reduced below normal. I recently had an example of this in a young lady in whom glycosuria was detected in the course of routine examination. Further observations showed that she always passed about the same amount of sugar whatever the diet, the percentage usually lying between 1 and 2 per cent. Her blood-sugar was low and never reached the normal leak-point of 0·15 per cent. even after 50 g. of glycose were administered in one dose, nor did this increase the glycosuria. One may conclude that a glycosuria which keeps at 1 to 2 per cent. independently of diet is of this renal type, and a practical deduction is that such patients should not be put on a restricted diet. It is very difficult, if not impossible, to get them free from glycosuria, but it is easy to cause them to waste and to become ill if such an attempt is made. Doubtless some of the cases of persistent glycosuria without symptoms that are described from time to time are of this class. But I have also had instances of intermittent glycosuria of the renal type. Thus a young man of 21 had glycosuria detected on examination for life insurance and on one occasion afterwards. He had no other symptoms. His blood-sugar was 0·064 per cent., and after 50 g. of dextrose it never rose above 0·12 per cent., falling again to 0·065 per cent. in 1½ hours, without any glycosuria. He evidently had a low leak-point, but when 50 g. of dextrose were given this was not necessarily reached. Another young man, aged 20, showed traces of sugar in the urine on three occasions

on examination as to fitness for work in the East. His blood-sugar was 0·1 per cent. and did not rise above this figure at any time after 50 g. of dextrose. At the end of 1½ hours he passed 0·46 per cent. of sugar and his blood-sugar was as low as 0·05 per cent.

I do not see how it is possible to recognise renal glycosuria of this intermittent type without observing the blood-sugar curve after the ingestion of 25 to 50 g. of dextrose. The cause of lowering the kidney threshold is quite unknown, and although the condition is called renal glycosuria on the analogy of phloridzin poisoning the majority of such cases show no evidence of renal disease. In true nephritis there may be lowering of the threshold, but more frequently it is raised. I consider that such cases of renal glycosuria call for no treatment.

Glycosuria Dependent on Endocrine Disturbance.

I will next deal with types of glycosuria which appear to depend on disturbances of endocrine glands. In order to comprehend these it is necessary to realise that the lowest or vegetative nervous system consists of two mutually antagonistic parts—the *sympathetic* which mobilises the body for defence, converting potential energy into kinetic, and the *parasympathetic* or extended vagus which stores up energy, especially the energy derived from the assimilation of food. Each of these coöperate with endocrine glands, the sympathetic with the adrenals, thyroid, and pituitary; the parasympathetic with the pancreas, and possibly the parathyroids. An important way in which the first group prepare for defence is by mobilising sugar into the blood-stream. Here it is normally utilised for muscular energy if the organism has to defend itself by fight or flight, or it is used for the production of fever. Cramer has shown that this is, at any rate, one of the ways in which fever is produced. If carbohydrate metabolism is normal the sugar is utilised at once, but if it is not there will be hyperglycæmia, though not necessarily glycosuria. Thus hyperglycæmia in pneumonia and rheumatic fever was observed some years ago before its significance was realised. I think we have in this fact the explanation of the influence of focal sepsis in aggravating diabetes. Sepsis will not necessarily cause hyperglycæmia. Thus, in six consecutive cases of recurrent boils I found hyperglycæmia in one but not in the other five. The occurrence of recognisable hyperglycæmia in sepsis indicates an imperfection in the sugar-storing mechanism, and if such an imperfection is already definitely present it will increase it. But it is defensive in origin and aim. In disease we frequently find a perversion of a defensive mechanism, and I look upon a parenchymatous enlargement of the thyroid as very frequently originating thus.

Thyroid Glycosuria and Hyperglycæmia.

I have recently had two striking examples of this disease in lads, where the enlargement was apparently due to a reaction against infection from septic tonsils; in each case the swelling went down considerably immediately after the enucleation of the tonsils, and although there was never glycosuria and no resting hyperglycæmia, the blood-sugar rose to 0·233 in one case, and to 0·21 per cent. in the other an hour after 50 g. of sugar were given, yet there was no glycosuria.

This is still more marked in exophthalmic goitre. I have never investigated the carbohydrate metabolism in this disease without finding a marked rise of blood-sugar following the administration of sugar. There may be no glycosuria because of the rise of threshold, but even the level of the raised threshold may be exceeded and then glycosuria follows. This may occur temporarily from a purely emotional cause. Thus in a severe and ultimately fatal case of Graves's disease in a man I had found marked hyperglycæmia. One day, some time after this, he suddenly passed sugar, and on inquiry I found he had had an emotional shock that day.

Do cases of hyperthyroidism ever develop true diabetes? I think they do if they have hyperglycæmia prolonged enough to damage their cell islets. A girl developed Graves's disease when her father became a prisoner of war in the hands of the Turks. Her condition grew worse as information as to his sufferings arrived, and when he died she was found to be suffering from glycosuria. After preliminary dieting the urine became free from sugar, but I found she had a resting hyperglycæmia of 0·198 per cent., which rose to 0·46 per cent. an hour after 50 g. of dextrose, when she passed 5·25 per cent. of sugar. She did well and kept free from sugar for about a year, when she suddenly went into coma as the result of an intercurrent infection.

An interesting case at present under my observation is that of a young woman with hyperthyroidism of 15 years' standing, which had produced not auricular fibrillation but auricular extra-systoles, which readily yielded to 2 gr. of quinidine sulphate twice a day. Her basal metabolism was + 55 per cent., and recently she had become troubled with fatty diarrhœa, the stools containing 53 per cent. of fat, 45·7 per cent. of which was neutral fat. Her diastase was 50 to 100 units, indicating a definite pancreatic insufficiency since the diastase output is usually lowered in ordinary hyperthyroidism. Her resting blood-sugar was 0·108 per cent., but it rose to 0·286 per cent. half an hour after giving 50 gr. of dextrose and even at the end of one and a half hours it was 0·23 per cent. when she passed 2·6 per cent. of sugar. At other times there was only an occasional trace of sugar. Yet her blood-sugar curve is that of severe diabetes. The following case is an interesting example of glycosuria in treated myxœdema:—

A lady of 55 was sent to see me with the following history. She was apparently one of the earliest cases to be treated by thyroid extract, about 30 years ago. She had taken 5 gr. daily ever since. In June of this year she complained of thirst and dryness of the throat, and her medical man found she was passing nearly 6 per cent. of sugar. On diet and 1 gr. of thyroid a day the sugar fell to a trace and then disappeared when the thyroid was reduced to ½ gr., but she began to get myxœdema again. Any increase of this dose or in the carbohydrate of the diet produced a return of sugar. When I saw her the only signs of myxœdema were a few patches of skin which suggested it, but she was passing sugar and her blood-sugar was very high—0·433 per cent. This seemed an ideal case in which to restore the balance between the thyroid and pancreas by insulin, but unfortunately she has a great prejudice against it. So I put her on Graham's "ladder diet" and allowed 1 gr. of thyroid a day; on this she kept free from sugar and the blood-sugar fell to 0·137 per cent. After a time we were able to increase the thyroid to 2½ gr. daily and maintain her blood and urine normal as to sugar although she was taking 1½ oz. of bread daily. It is worth noting that her father died of diabetes.

I think it is not unusual for patients with long-standing myxœdema to develop glycosuria. At St. Bartholomew's Hospital out of 11 consecutive cases four were found to be passing sugar (Garrod). It is well known that they may become intolerant of thyroid. But such marked hyperglycæmia is, I think, unusual. Even such cases can be successfully treated if alimentary rest is used as an aid to treatment and the dosage of thyroid is regulated with sufficient care. But the following case raises the question in a different and an interesting form:—

The wife of a medical man, aged 32, was worried because she was putting on weight rather rapidly. She therefore started taking 3 gr. of thyroid extract daily at Christmas, 1922, and lost over a stone in weight. In May, 1923, she suffered from palpitations and shortness of breath so she stopped taking thyroid, but her weight continued to fall in spite of rest. In September she became thirsty, had pruritus vulvæ, and was found to be passing sugar in large amounts. I found her resting blood-sugar was 0·38 per cent. I put her on 2½ gr. of quinine hydrobromide three times a day and dieted her by Graham's method. She became free from sugar on the first day of fasting, and when her diet contained 5 oz. of milk and 3½ oz. of bread her blood-sugar was 0·144 per cent. She is still free from sugar on 90 g. of added carbohydrate, but her blood-sugar is 0·153 per cent. and she is still losing weight, so she is starting a course of insulin. The pulse is still rapid and she is a little tremulous, but she has no other signs of hyperthyroidism.

What is the explanation of this case? Personally, I think her increasing weight was the first sign of impaired carbohydrate metabolism, and that taking

the thyroid extract converted her from a case of latent to one of consecutive glycosuria by still further upsetting her metabolism. One thing, however, to which I would specially call your attention is that as a case of Graves's disease improves the threshold may fall faster than the hyperglycæmia, so that I do not worry particularly about the appearance of a certain amount of sugar in the urine if the general condition of such a patient is obviously improving. Thus a woman of about 40 had Graves's disease and developed leukoderma. Her resting blood-sugar was 0·069 per cent., but after 50 g. of dextrose it rose to 0·323 per cent. at the end of an hour, yet she had no glycosuria. She improved very much, and as she did so she occasionally passed sugar. This was about four years ago and I frequently see her and she is apparently well.

The typical blood-sugar curve in hyperthyroidism is a sharp rise reaching its maximum in an hour and then usually a rather sharp fall again, but not reaching normal in one and a half hours (Mackenzie Wallis). In this type of case it is the thyroid rather than the glycosuria which calls for treatment, the essential features of which are rest, physical and emotional, removal of septic foci, particularly in the tonsils and bowels, and administration of quinine hydrobromide in doses of 3 to 5 gr. three times a day. The dietetic restrictions need not be very drastic as a rule.

Adrenal Glycosuria.

The antagonism between the pancreas and the adrenal medulla is well known. It is expressed in such phenomena as Loewi's adrenalin pupillary reaction, and in the dribbling secretion of pancreatic juice which follows removal of the adrenals, a secretion which can be checked by injections of adrenalin. But it is seen most clearly in the opposite effects of adrenalin and insulin on carbohydrate metabolism. That adrenalin injections could produce glycosuria was shown by Blum more than 20 years ago. Later it was shown that the diabetic puncture produced its effect through the adrenals and possibly the pituitary in addition. Severance of the nervous channels between the medulla and the adrenals rendered diabetic puncture inoperative. J. H. Burn has proved that there is no direct antagonism between adrenalin and insulin as there is between pituitrin and insulin. He agrees with the accepted view that adrenalin turns the glycogen of the liver into sugar, thus interfering with the storage mechanism.

As adrenalin raises arterial tension as well as producing glycosuria it is tempting to assume that the glycosuria associated with high tension in later life may be adrenal in origin, especially as it is apt to occur in overworked, worried people. But there is no proof of this. I should, however, like to call attention to the form of the blood-sugar curve in this nervous type of glycosuria. It is characterised by a sharp peak just where the normal curve is rounded. This peak exceeds the threshold, and this is when the glycosuria occurs. It suggests a delay in the storage mechanism coming into action. Now adrenalin is activated through the emotional nervous system and in its turn acts on the sugar-storing process. So that there is at least a prima facie case for investigation of such cases along the line of adrenal glycosuria. It is usually sufficient to deprive such patients of sugar as such while allowing them to take a reasonable quantity of starch. In this way the mechanism for storage of sugar as glycogen is not suddenly overtaxed immediately after food. The process of starch assimilation is a more gradual one. But the most important part of treatment is a holiday and attention to general hygiene.

Pituitary Glycosuria.

This is due to overaction of the pars intermedia of the pituitary. It is often associated with signs referable to other portions of the gland. If the pituitary is enlarged there may be optic atrophy and bitemporal hemianopsia, some interference with the third nerve and X ray evidence of enlargement of the pituitary fossa. If the anterior lobe is overacting there will be signs of acromegaly as well—if it is underactive there will be diminished sexual development, while if the posterior lobe is underacting there will be obesity and diabetes insipidus as well as mellitus. The glycosuria may be intermittent since the pituitary seems to be rhythmic in its functions, while the characteristic of the blood is the slow rise of sugar in it and an equally slow fall, giving a rounded form to the curve. Mackenzie Wallis has called attention to the frequency with which signs of pituitary disease occur in intermittent glycosuria, and has also pointed out the close resemblance between the blood-sugar curve in such pituitary cases and in the glycosuria as distinct from the lactosuria of pregnancy. This confirms the view that the glycosuria of pregnancy is due to the stimulating effect of pregnancy on the pituitary; the curious alteration of the facies in pregnancy resembling a mild degree of acromegaly suggests this also. We now have direct experimental evidence in support of this view. Dixon has shown that injections of ovarian extract stimulated the secretion of pituitrin, while J. H. Burn found that although pituitrin did not in itself cause hyperglycæmia, it was able to inhibit the fall of blood-sugar which would otherwise have followed the injection of insulin. I think, therefore, the statement is justified that the glycosuria of pregnancy is due to its stimulating effect on the pituitary which then directly inhibits the internal secretion of the pancreas. It may well be that in its inception this process is physiological, diverting the stream of sugar from storage in the maternal tissues to the use of the fœtus.

I saw an interesting example of this some years ago in a woman of 42, who looked acromegalic, had hair on her cheeks, a blood pressure of 170 mm., and glycosuria. She was pregnant, and as the pregnancy proceeded the glycosuria became less amenable and she developed hydramnios. Subsequently she was delivered of a living child, after which she remained free from sugar on an ordinary diet. The occurrence of hydramnios is interesting as it is a common complication of pregnancy in true diabetes. Yet pregnancy is not very likely to occur in a diabetic of 42. Some years afterwards she turned up again with diabetes of the ordinary type. I conclude that her pregnancy stimulated a pituitary already tending to be too active, and that afterwards, although she was free from glycosuria for some years, her blood-sugar kept at a sufficiently high level to exhaust her cell islets. Unfortunately, this case occurred before opportunities existed for routine examination of the blood-sugar. The influence of the male gonads on the pituitary I could also illustrate from a remarkable case, but for my present purpose it is sufficient to say that here a testicular graft for atrophy following mumps completely changed the blood-sugar curve.

The combination of glycosuria and Fröhlich's syndrome can only be explained by assuming an overactive pars intermedia with diminished activity of the rest. Thus a man of 50, who had always been fat, and then weighed more than 18 st., was found to have glycosuria. Sexually he was infantile and his blood-sugar curve was of the pituitary type, reaching 0·310 per cent. an hour and a half after the ingestion of 50 g. of dextrose, and still standing at 0·261 per cent. at the end of two hours when he passed 3·6 per cent. of sugar.

Pancreatic Glycosuria.

No difficulty is experienced in recognising cases of glycosuria associated with frank pancreatic disease. There is fatty diarrhœa, due, as in the case already referred to, to an excess of unsplit fats, and there may be creatorrhœa. The output of urinary diastase is increased to 50 units or more and the adrenalin eye test may be positive. Yet how often are such signs found in ordinary diabetes? It is true that they may be present in the early stages or even before glycosuria occurs and subsequently subside. Thus I saw a case of a young lady who had symptoms of

pancreatitis and then glycosuria. She cleared up with dieting for a time and then returned to ordinary food. After that she showed no evidence of pancreatitis but the ordinary symptoms of diabetes, which subsequently proved fatal. Unless one had seen this case in the early stages its pancreatic origin would have been missed.

TRUE DIABETES.

But when full allowance is made for all this, one must admit that the pancreatic origin of true diabetes is still unproven. My own view is that it is due to a more profound metabolic disturbance than that evoked by one endocrine gland. Eppinger, Falta, and Rudinger put forward the hypothesis of a disturbed endocrine balance as the cause. If one endocrine gland were diseased we could understand a loss of balance comparable to that which occurs when a group of muscles is paralysed. But such signs of endocrine disease are lacking in ordinary diabetes even if carefully looked for. It will be noted that the sympathetic stimulates all the endocrine glands which mobilise sugar into the blood—i.e., the thyroid, adrenal, and pituitary—while it probably inhibits the pancreas, either directly or by antagonising the vagus, thus checking sugar storage. Overaction of the sympathetic at any rate means increased katabolism and usually hyperglycæmia. And as hyperglycæmia if not caused by deficiency of the pancreatic cell islets, will at any rate damage them in time, we may admit that all cases of diabetes are ultimately associated with insufficiency of pancreatic internal secretion.

The blood-sugar curve starts above normal, rises very sharply, and keeps at a high level for at least two hours, so that it differs materially from the other curves I have discussed. But to my mind it is seldom necessary to do a blood-sugar curve in what appears clinically to be a clear case of true diabetes, nor is it advisable. This procedure should be reserved for glycosuria of doubtful origin.

Alimentary Rest.

The treatment of diabetes by alimentary rest undoubtedly represented a great advance. I still have cases under my care occurring in young people about 1915, when I started using this method systematically. They appear to be in an arrested state. But metabolically, they are at best among the lame and the halt, while many have fallen by the way. This is because we had no satisfactory method of checking hyperglycæmia with its evil consequences, for though interpolated days of fasting or of vegetable and egg diet have some effect in this direction, that effect is not sufficiently prolonged.

Insulin.

No words of mine are needed to commend insulin, for not only has its discovery proved a theoretical belief long held, but it has been of immense practical value already. I will merely describe my usual procedure with it and then consider some of the limitations of the drug. Throughout I will assume that the opportunities for blood-sugar estimations are present but restricted as they are in general practice. I first put the patient on a 48-hour mitigated fast, allowing soup, beef-tea, tea or coffee, water ad lib., and alcohol in suitable cases. Most cases become free from glycosuria on this. Then I give 48 hours of vegetable and egg diet. If the patient is still free from sugar I put him through Graham's Ladder Diet. At the top of the ladder, or if sugar reappears at any stage of it, I estimate the resting blood-sugar if this has not already been done, and if it is above 0·18 per cent. I give 10 units of insulin daily before breakfast or lunch. If the resting blood-sugar is between 0·14 and 0·18 per cent. I give only 5 units. If it is below 0·14 per cent. I do not regard the case as one for insulin. I like to know the blood-sugar six hours after insulin is given, for the dosage will largely depend on the rate at which it falls. Even if the patient is keeping free from glycosuria on insulin I do not add carbohydrate to the diet for two or three weeks. If not free from sugar on 10 units daily I give a second dose of 5 units, and may increase the dosage to one of 15 and a second of 10 units. I do not often find it necessary to exceed these doses except in actual or threatened coma. I believe that difficulties which appear to call for higher dosage are often due to adding carbohydrate to the diet too soon, when the action of insulin may become uncertain. When conditions appear to have become stable I add 5 oz. of milk to the diet, and two days later add ½ oz. of bread, increasing this by ½ ounces every other day until 4 oz. are reached, provided there is no return of glycosuria and the blood-sugar is keeping within normal limits. I do not trouble about slight returns of glycosuria if the blood-sugar is continuing to fall, as I think the kidney threshold often falls quicker than the hyperglycæmia as the case improves.

If the patient continues to be free from sugar the question will arise whether to diminish the dose of insulin or to increase the diet. If the calorie intake is adequate and weight is being maintained, I diminish the dose of insulin unit by unit until sugar just reappears; then interpolate a day of vegetable and egg diet and after that return to the former diet with 1 unit more of insulin than that on which glycosuria recurred. If the calorie value is low I increase the carbohydrate in the diet while keeping the dose of insulin the same. When sugar just reappears I interpolate a day of vegetable and egg diet, and then return to the former diet with only three-quarters of the amount of carbohydrate taken during the day on which glycosuria recurred. In any case I give a day of vegetable and egg diet once a fortnight. But details must depend on the individual case.

Acute Cases.

As an example of its success, I may quote the case of a little girl with severe diabetes with ketosis of recent origin, and a blood-sugar of 0·42 per cent. She is now keeping free from glycosuria and hyperglycæmia on a diet of approximately 1600 calories including 5 oz. of milk and 1½ oz. of bread without any insulin, and she has never had more than 5 units a day, which was gradually diminished as the blood-sugar fell. For more than a month now she has had no insulin at all, yet the blood-sugar is only 0·065 per cent. Indeed, I have been struck with the extraordinarily good results one may get with insulin in children. It is too early to speak positively, but it appears to me possible if the hyperglycæmia is thus controlled, that as the child grows fresh cell islets come into existence without being damaged as fast as they are formed. In this way the type of case which was previously the most unsatisfactory may become the most hopeful to treat. The following case still under my care suggests, however, that sometimes diet alone may be as successful as when aided by insulin:—

A girl of 26, whose symptoms were of very gradual onset but probably of a few months' duration, had a blood-sugar of 0·26 per cent.; ketosis was present. After alimentary rest she reached the top of the ladder with a blood-sugar of 0·1 per cent. On gradually increasing the carbohydrate intake to 5 oz. of milk and 2½ oz. of bread, which equals 46 g. of added carbohydrate, glycosuria just reappeared with a blood-sugar of 0·14 per cent. She then had a day of vegetable and egg diet which cleared up the glycosuria, and the same plan was repeated with 5 units of insulin daily. Glycosuria reappeared in spite of this when the added carbohydrate was only 38 g. She then kept free from glycosuria with a normal blood-sugar and without any insulin on less carbohydrate.

The interesting features here are the prompt improvement on diet and the failure of insulin to improve the situation as to carbohydrate tolerance. But as the blood-sugar began to rise again and reached 0·19 per cent. I have resumed insulin.

Chronic Cases.

The effect of insulin is not nearly so striking in the chronic cases. I have tried it on several of my original cases which have been treated by alimentary rest since 1915 or 1916, and although some degree of benefit has undoubtedly resulted, I have, on the whole, been rather disappointed. The following case

is worth considering because, owing to the skilled and devoted attention the patient receives, the data are specially full, though I do not propose to burden you with the details. He is now about 60 and retired from his profession about 15 years ago on account of diabetes. Just ten years ago I saw him on the verge of coma. On the somewhat unsystematic methods of alimentary rest we were then experimenting with he improved very much, and until the introduction of insulin he remained in a stationary condition on a very restricted diet, although on one occasion an attack of influenza nearly sent him into coma again. He was one of the earliest cases to be treated with insulin in this country, but his improvement has not been very striking. The difficulty is that if his blood-sugar is brought down even to 0·15 per cent. he has hypoglycæmic symptoms, while at this level of blood-sugar he can tolerate only a very limited diet without a return of glycosuria. It seems to me that only those cases of severe diabetes survive for anything like this length of time which can adjust themselves to bear a certain degree of hyperglycæmia, and if this is now reduced they become uncomfortable at once. But if the hyperglycæmia continues it follows of necessity that no striking improvement can occur.

Another difficulty may occur with insulin treatment if the weight is allowed to increase quickly. Metabolism bears a definite relation to the total body-weight, and, as this goes up, the whole of the metabolic processes are increased. So that the chances of recurrent glycosuria are thereby enhanced. We should not be too eager to increase the weight rapidly.

FAT METABOLISM IN DIABETES.

The following case illustrates some points in connexion with the difficult question of lipæmia in diabetes. A man of 40, who had been known to be suffering from glycosuria for about two years, was admitted to St. Bartholomew's Hospital under my care with 2 per cent. of sugar and definite ketosis. He did not become free from sugar on a fast or on going up the ladder. He showed marked lipæmia and a blood-sugar of 0·263 per cent. Ten units of insulin were given daily, which rendered him free from sugar, but as he began to get œdematous his diet was increased and a second dose of insulin, 5 units, was given daily. On this his blood-sugar was 0·117 per cent., but the lipæmia increased; and he began to sweat after insulin was given, the first indication, in my experience, of hypoglycæmia. His insulin was therefore reduced to two doses of 5 units, the vegetables containing 5 per cent. of carbohydrate were increased, and the fat in the diet was reduced as much as possible. His blood-sugar rose to 0·17 per cent. and lipæmia was still present. I now decided to increase both the insulin and his carbohydrates to see whether in this way we could get him free from lipæmia. On reaching a calorie value of 1818, including 45 g. of carbohydrate as well as fat, we abolished lipæmia and kept the blood-sugar at 0·137 per cent. with two daily doses of 10 units of insulin. On this he was free from glycosuria and acetonuria. The conclusion would appear to be that lipæmia is best treated by increasing both the carbohydrate diet and the dosage of insulin. His general condition decidedly improved on this line of treatment. T. H. Oliver says:

> "Fat properly absorbed into the tissues appears to increase the storage of carbohydrates; if not so absorbed, or if mobilised by calcium, the storage is interfered with. Possibly improper storage of the fat may account for the tendency of a high fat diet to produce glycosuria in some cases of diabetes. It is noticeable that practically all conditions which lead to a hyperglycæmia lead to a lipæmia as well; this may be attributed to diminished oxidation."

At any rate, we may agree that this shows how close are the links between the metabolism of the two foodstuffs, and that diabetes is not merely a disturbance of carbohydrate metabolism. My case would further show that it is sometimes easier to control lipæmia if the amount of carbohydrate metabolised is deliberately increased by adding starch to the diet and giving larger doses of insulin than by restricting the fat in the diet.

It has, of course, long been recognised that it is the disturbance of fat metabolism which ultimately leads to coma. It was the recognition by Hurtley that much of the toxic diacetic acid came not from the fat of the tissues but from the fat of the food, which led in this country to the introduction of alimentary rest by Graham. In America Allen reached the same conclusion as to treatment by a different route. Since this has been appreciated coma has become rarer, though sometimes it remained inevitable in cases of "total" diabetes, or in the presence of intercurrent infection, particularly as we were still without a method of controlling the hyperglycæmia effectively, which in itself further disturbs fat metabolism.

DIABETIC COMA.

Now that we have in insulin a method both of controlling hyperglycæmia and improving fat metabolism, our hands have been greatly strengthened in dealing with diabetic coma. A striking success was achieved in such a case under my care with Dr. Graham's aid. A man was admitted to St. Bartholomew's Hospital in deep coma. His blood-sugar was 0·39 per cent., there was marked lipæmia, and his alveolar CO_2 only 0·9 per cent. His bowels were cleared out with an enema of magnesium sulphate and 30 units of insulin were given at once. In the course of 24 hours 110 units were given and the blood-sugar fell to 0·23 per cent. Two days later air-hunger returned and his blood-sugar rose despite 140 units of insulin to 0·36 per cent. He complained of pain in the right ear and the drum was found to be bulging. It was punctured and pus escaped. After that he steadily improved, and we succeeded in keeping his blood-sugar normal on two doses of insulin daily, one of 20 and the other of 10 units. He remained free from sugar for a month before discharge from hospital, although his calorie intake was worked up to 2365. I recently heard that he is still free from sugar and diacetic acid, although it is six months ago since he was admitted. This case illustrates very well the powerful aid insulin renders in coma, but also the great influence focal sepsis has in antagonising it, for the blood-sugar rose to 0·36 per cent. in the presence of otitis media in spite of 140 units of insulin.

I cannot hope to have dealt with all the aspects of a problem which is now changing from day to day, but it is only by pooling our common experience that advance can be made. And once again I would like to urge that it is resting hyperglycæmia that matters, for it establishes a vicious circle of serious import.

An Address
ON
INSULIN IN GENERAL PRACTICE.

Abstract of a Paper read before the Hampstead Medical Society on Dec. 6th, 1923,

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INSULIN can be used in general practice with great advantage to the patient and without any danger, provided that certain precautions are observed. There has naturally been some difference of opinion as to the best method of using insulin. Banting[1] and the Toronto school, and Allen[2] in U.S.A., Graham and Harris,[3] Spriggs,[4] Poulton,[5] MacLean[6] in this country all argue that the aim of the physician should be not only to render the urine sugar-free but also to maintain the amount of sugar in the blood within the normal limits of 0·09–0·12. Joslin[7] aims at keeping the urine sugar-free, but Geyelin,[8] Woodyat,[9] Wilder,[10] all think that it does not matter if the patient does pass sugar and has a high blood-sugar just before the insulin injection.

IDEAL OF TREATMENT.

My experience during the last six months, after watching the progress of the patients who are having insulin, has confirmed me in my opinion that it is essential to maintain the same ideal as we have always had—namely, to keep the blood-sugar within normal limits if the patient is to continue to progress satisfactorily. The first patient treated in the medical clinic at St. Bartholomew's Hospital illustrates very well many points and difficulties in the use of insulin. The patient, a man, aged 26, had been ill for three years, and had been very near coma about four weeks before admission. In spite of two starvation days, two egg and vegetable days, and two more starvation days, he continued to pass sugar, and the blood-sugar remained at 0·20 per cent. When the diet was increased to protein 53·2 g., fat 109·5 g., and 16 g. of

FIG. 1.

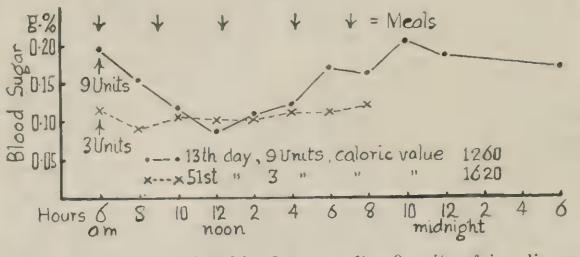


Chart to illustrate fall of blood-sugar after 9 units of insulin on the 13th day of treatment and after 3 units on the 51st. (From "Pathology and Treatment of Diabetes Mellitus," Oxford Medical Publications.)

sugar in the form of vegetables, total calorie value 1260, the blood-sugar varied between 0·23–0·25 per cent. and the sugar output from 25–33 g. Insulin was given in gradually increasing doses up to 10 units, and by the thirteenth day the urine only contained sugar in the period immediately before the insulin injection, and the blood-sugar at that time was 0·20 per cent. The blood-sugar was estimated throughout the day at two-hourly intervals, and the curve (see Fig. 1) is typical of the action of insulin, and should be remembered whenever the action of insulin is considered. The maximum lowering of the blood-sugar in this case occurred at the sixth hour after the injection (although at may be as early as the third hour) began to pass off at the tenth hour, and was completely over at the sixteenth hour. The diet and dose of insulin were kept constant, and the morning blood-sugar gradually diminished to within normal limits, so that by the fifty-first day, after only 3 units of insulin, it was below 0·11 per cent. for 14 hours. The patient's sugar-tolerance continued to improve, and on the seventy-third day, when no insulin was given, he was able to eat 40 g. of bread without passing any sugar in the urine, though the shape of the blood-sugar curve was abnormal. Now, ten months after the treatment was started, he has gained 1½ stone in weight, and feels very well. He has usually had a normal blood-sugar 24 hours after the last insulin injection, but when he had a cold and sore-throat the blood-sugar was 0·19 per cent. The diet was therefore reduced from 1800 to 1400 calories, the bread was stopped, and the insulin increased to 20 units. Two weeks later the blood-sugar was again normal, and the insulin was reduced to 15 units, and the diet slowly increased again.

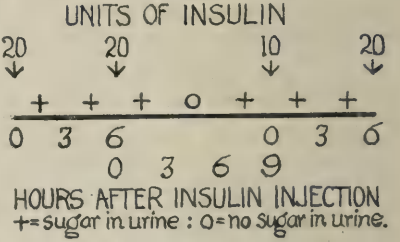
Blood-sugar Observations Not Essential.

In learning how to use insulin it was necessary to make many observations of the blood-sugar, but these are now unnecessary, provided that the urinary sugar is watched and the effect of the insulin observed. But before starting treatment it is important to discover and treat any other sources of infection, such as boils, pyorrhœa, or any septic foci. Tuberculosis of the lungs should be sought for most carefully, as it is a common complication in long-standing cases. It is a good plan to start the treatment with an attempt to get the urine sugar-free by dietetic measures. It is wiser to keep the patient in bed, but it is not necessary to give a long period of starvation, such as Allen originally used, but a one or two days' fast, followed by a gradual increase in the diet to three eggs, 2 oz. of meat, 2 oz. of bacon, 2 oz. of ham, 1½ oz. of butter, 1 oz. of cream, 12 oz. of cooked green vegetables, and 4 oz. of uncooked vegetables. This makes a total of 57·7 g. protein, 118 g. fat, 16 g. of sugar in the form of vegetable, with a calorie value of 1358. This amount of food is sufficient for an adult of 10 st. 5 lb., and is rather less than 1 g. of protein per kilo (½ g. per pound) and 21 calories per kilo (10·5 per pound). If the patient weighs more or less than 10 st. 5 lb. the diet must be increased or decreased, keeping the proportion of grammes of protein and calories per pound about the same.

Value of a Standard Diet.

It is, I think, a great advantage to have a standard diet, such as the ladder diet, as it is very simple for the patients to carry out, and the necessary deductions or additions, according to the weight of the patient, are very easily made. The correct diet for children is much more difficult to adjust. The basal heat production should be ascertained from the tables of Benedict and Talbot, or from Wilder's nomograph.[11] An addition of 20 per cent. is made to allow for the effect of exercise, &c., and the diet worked out, allowing 1·0–1·5 g. of protein per kilo (0·5–0·75 g. per pound of body-weight). If on this diet the patient continues to pass sugar, 10 units of insulin should be injected before breakfast, and the urine collected in approximately three-hour periods throughout the day. The urine should be tested qualitatively for sugar by Fehling or Benedict's test. A nurse or the patient can soon learn to do these tests, and keep a three-hourly chart of them for the doctor. If the patient was passing sugar the blood-sugar was over 0·19 per cent., and the urine passed in the first three hours will certainly contain sugar. If,

FIG. 2.



Three-hourly chart.

however, the blood-sugar has decreased, as in Fig. 1, below 0·19 per cent., there will be no sugar in the urine from three to six hours after the insulin. If, however, the dose of insulin was not big enough, the blood-sugar will not fall below 0·19 per cent., and sugar will be present in every specimen. In this case, after three days, the dose of insulin should be increased to 15 units, and if the specimen of urine still contains sugar, the dose must be increased to 20 units after another three days. If the dose of insulin is sufficient to lower the blood-sugar below 0·19 per cent., the urine from three to six hours will be sugar-free; but that from six to nine hours will contain sugar, if the blood-sugar has risen above 0·19 per cent. If this occurs the dose of insulin should be kept steady, and the urine of the period from six to nine hours tested daily. If the dose of insulin is adequate the sugar-tolerance of the patient will improve, and the urine of the period six to nine hours will become sugar-free. If it does not, then the dose of insulin must be increased. If the urine for six to nine hours becomes sugar-free, the urine from nine to 12 hours must be tested, and this in turn will become sugar-free. This process must be continued until the urine is sugar-free throughout the 24 hours.

Watching for Overdosage.

At this stage it is a great advantage to know what the blood-sugar is, but if this is not possible it can be gauged by watching the effect of the insulin. An adult who has a normal blood-sugar cannot take more than 10–12 units on this diet without having mild symptoms of overdosage. It is not necessary to give sugar for the mild symptoms like sweating or inertia as a hot drink, an egg or a tomato will at once relieve the patient. If the method described here is used there should be no serious symptoms, but it is well to warn the patient or nurse that adrenalin, 1 in 1000, ℥ xv., subcutaneously will at once relieve the symptoms, or two to four lumps of sugar by mouth.

If no symptoms of overdosage occur after 20 units it is probable that the blood-sugar is above 0·14 per cent., and the insulin should be kept steady at 20 units until symptoms are produced, and should then be decreased by 2 units at a time, watching the patient carefully. Experience has shown that the symptoms do not always tally with the blood-sugar, and it is a great advantage to know exactly how high the blood-sugar is before the insulin is given. When the blood-sugar is normal, and only 10 or 15 units are required, the diet can be gradually increased, but it is wiser to add to the protein and fat ration in preference to the carbohydrate, so as to give the β cells of the islands of Langerhans as good a rest as possible. The calorie value may be raised to 1800 or 2000, and the protein ration to 1·5 g. per kilo (0·75 g. per pound) of body-weight.

Procedure in Mild Cases.

The above procedure is necessary for the patient with severe diabetes, who continues to pass sugar even after severe dietetic restrictions. Most patients cease to pass sugar on the diet suggested, but the blood-sugar may still be high, 0·17 per cent., and it is an advantage to know the blood-sugar at this stage. If this is not possible, a dose of 10 units should be given each day, and the effect of increasing the dose to 12 or 14 units watched. If, after 14 units, no symptoms of overdosage such as sweating or a feeling of inertia are observed, the blood-sugar is probably above 0·14 per cent. The dose should be kept at 14 units until symptoms appear, and then decreased to 12 or 10 units. When this stage has been reached the diet should be kept constant for two to four weeks before the addition of the extra protein and fat. Later on ½ oz. of bread may be given after the insulin injection. If this is tolerated the bread can be increased by ½ oz. portions, first at the insulin meal and later on at other meals. The exact correspondence between sugar and insulin is not quite certain, but 1 unit is sufficient for 1–1·5 g. of sugar. This ratio is important if it is desired to add bread together with the equivalent amount of insulin. Although it is sometimes necessary to do this, I do not think that it is really good practice. The insulin requirements of the full ladder diet with 16 g. sugar are not yet known, but may be regarded as 50 units $+x$ units. If a patient is being given 10 or 20 units, it is clear that the β cells of the patient will only have to produce 30 or 40 units $+x$ units. It is this relief of the β cells by the correct use of insulin which is the important point to bear in mind. Even if the patient can also eat 1 oz. of bread the insulin requirements will be 50 units $+$ (14 or 8) units $+x$ units. The correct way is still to think that the β cells are being spared the production of 10 or 20 units of insulin.

If the patient continues to pass sugar after 20 units in the morning, he needs more insulin, but it is wiser to treat such a patient either in a hospital or nursing home, or with two competent nurses, in order to avoid the danger of overdosage, since the dose may have to be increased to 25 units in the morning and 20 units at night.

Treatment of Coma.

The condition of coma requires prompt treatment with large doses of insulin. There is usually already an excess of sugar in the blood, as it has varied from 0·30–0·39–0·73 per cent. in my last three cases, so that it is usually safe to give 30 units of insulin. But a dose of 50 g. (2 oz.) of dextrose by mouth or by œsophageal tube cannot do any harm. If the patient has not shown any signs of returning consciousness in three hours another 20 units should be given. The dosage can be gauged by testing the urine every three hours. If sugar is still present from three to six hours after the injection it is safe to give another 20 units. If there is no sugar in this specimen no insulin should be given until sugar reappears, and then only 10 units. In this way the dose of insulin can be regulated with safety. It is better to give water only for two days, and then start on the gradual ascent of the ladder diet. It is most important to search for any other sign of infection, as in four out of five cases of coma at St. Bartholomew's Hospital an acute infection has been found. If this is the case, the calorie value should be rapidly increased, and the insulin dosage regulated accordingly.

OPERATIONS AND MINOR AILMENTS.

Patients suffering from such conditions as carbuncles, gangrene of the leg, appendicitis, &c., should be prepared for operation by treatment with insulin. If the operation can be delayed for a few days it is better to get the urine sugar free by fasting and insulin, but if the operation is urgent a dose of 30 units of insulin and 50 g. (2 oz.) of dextrose should be given immediately before the operation. Afterwards the diet for some days should consist of the ordinary diet which is given to this type of case, milk, &c. The sugar output is watched by testing each specimen of urine and giving insulin on the same system as that described in the treatment of coma. The anæsthetic should be gas and oxygen by preference, but if this is not sufficient a little ether may be given as well. Local or spinal anæsthetics are very good.

The minor ailments, such as "colds in the head," tonsillitis, &c., require careful treatment. They should always be taken seriously, and the patient should go to bed. It is better to reduce the diet by one-third and add another 5 units to the dose of insulin. When the patient is better the food can be increased again. Whether the infection acts directly on the β cells, or indirectly by causing a demand for a bigger output of insulin than they can produce, is unknown. The minor infections are largely responsible for the decline in sugar tolerance which was so disappointing in the old days. One important point in the treatment is to relieve the constipation which is nearly always present, and especially when the patient is comatose.

From this description it is clear that the use of insulin does not free the patient from dietary restrictions, but the improvement of the clinical condition is so striking that the patients are much more willing to put up with these than they were before insulin was introduced.

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Sir James Crocket, Dallington Lodge, Northampton, Vice-chairman of the Northampton General Hospital, has sent a cheque for £5000 towards the cost of a new isolation block.

A CASE OF HEART-BLOCK PRESENTING SOME UNUSUAL SIGNS.

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THE case here described exhibited certain features of clinical and cardiographic interest which seem to merit recording.

A male, aged 20, had pneumonia at 10 years, and doubtful tuberculous peritonitis at 13. Influenza in 1919. Admitted to the City of London Hospital in April, 1920. He was then very anæmic, had a soft systolic mitral bruit, stained sputum, and mild, irregular pyrexia. There were no abnormal signs in the lungs, and the sputum was negative for tubercle bacilli on 11 occasions. Discharged improved, and having gained 7 lb. in weight. Readmitted January, 1921, with hæmoptysis. He was afebrile, with pulse of 110. Sputum was negative as to tubercle bacilli on nine occasions. Hæmoptysis ceased, pulse was reduced to 80, and on discharge he went back to his work. Later developed "faint attacks," though he never completely lost consciousness, and he was admitted to the hospital again in October, 1921. He then complained of fainting attacks, dyspnœa, and palpitation. The heart was normal in size; there was a systolic murmur at apex conducted to axilla. At the base the sounds were normal. The pulse was 84, of fair volume and tension. The lungs were normal, the urine contained a faint trace of albumin. No other abnormalities discovered.

Cardiographic Findings and Course of Case.—Prior to this admission a cardiogram (Fig. 1) had been taken. This showed a slight grade of block, the As-Vs interval being 0·24 seconds. The ventricle responded to supraventricular stimuli, but the form of complex was abnormal, occupying 0·14 seconds. There was slight notching of the downward deflection, and the picture was that of a contraction commencing in the left ventricle. Conclusion: Partial block of the main division of the bundle and also block of the right branch of the bundle. Both Wassermann reaction and blood culture were negative. Blood count showed only a slight degree of anæmia. About a fortnight after admission the pulse-rate suddenly dropped to 36 per minute, and it was evident that complete block was established. The second cardiogram (Fig. 2) showed complete heart-block; the auricle was contracting at the rate of 120 per minute, the ventricle 36 per minute, but whereas in the previous cardiogram the right branch of the bundle was shown to be blocked, in this case it was the left branch which was in default, as evidenced by the direction of the deflections. On Nov. 13th, 1921, the complete block had disappeared, and the appearances of the cardiogram were the same as in Fig. 1. The following day complete block occurred again and remained complete till death. On the 17th, at 8 P.M., the patient felt dizzy and "lost himself" for a second. During the whole of the 18th he felt very "seedy," and the following night he had a bad attack of faintness with slight twitching of the face and limbs, but no convulsion. Lesser attacks occurred frequently. At the apex of the heart the auricular beats could be distinctly felt and seen, and with the stethoscope could be heard as loud regular beats bearing no time relation to the forcible ventricular beat which occurred usually at the rate of about 24 per minute. Occasionally the ventricular beat would stop for a period of 10–12 seconds, the patient's eyes would close, and the succeeding beat would be followed by a deep sigh and reopening of the eyes; there was no twitching. Atropine and sodium salicylate in full doses produced no effect on the heart-rate. Mercury and iodides also failed to produce any effect. Cardiograms showed, on Dec. 24th, complete heart-block with right bundle branch block; on the 28th complete heart-block with left bundle branch block; and on Jan. 8th, 1922, the complete heart-block with right bundle branch block again. On Feb. 2nd the patient's condition continued so distressing that it was determined to try the effect of digitalis in an endeavour to stimulate iodiopathic contractions in the ventricle. He was given 1/240 gr. nativelle twice daily, and on the 11th the auricular rate had fallen to 80–90 from 110–120, whilst the ventricular rate remained unchanged. On the whole the patient felt rather more comfortable and had no attacks. Another cardiogram (Fig. 3) showed that the period between the auricular beats was unequal; some beats were inverted and appeared to arise from an ectopic focus. On the 14th definite coupling appeared and the digitalis was stopped. The patient was quite comfortable and the ectopic beats were effective. Another cardiogram (Fig. 4) showed an auricular rate of 140–150. The auricular complexes were abnormal; in lead 3 they were alternately inverted, the rise in rate to about double suggested the possibility of alternate auricular extra systoles. There was coupling of the ventricular beats; the first beat of the couple, supraventricular, showed right side branch block following an ectopic beat arising in the left side of the ventricle. In lead 1 the second beat of the couple was apparently arising in the interventricular septum. Subsequently the patient had no further faint attacks, he felt more comfortable, but complained of palpitation. The auricular systole was not nearly so forcible, and the sound could be heard faintly over the base of the heart, but not at all at the apex.

FIG. 1.

FIG. 2.

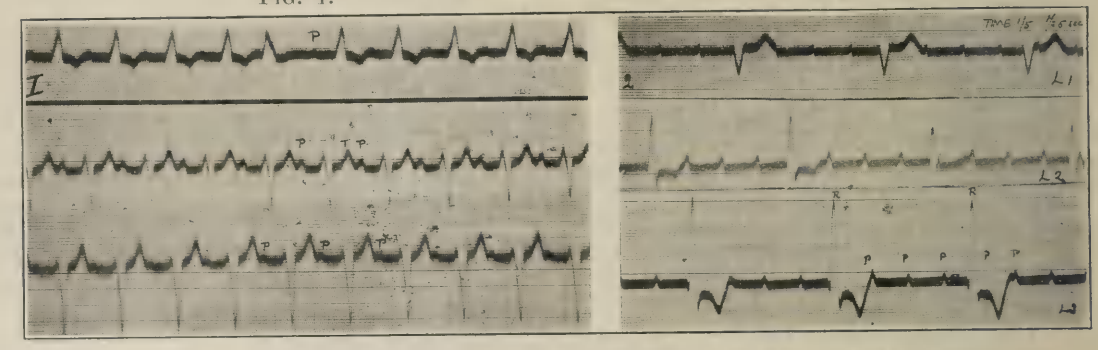

FIG. 1.—Partial block of main division of bundle and block of right branch of bundle.
FIG. 2.—Complete heart-block of left branch of bundle.

On March 7th it was resolved to make a further effort to propagate ectopic beats via the sympathetic system. Half a grain of thyroid extract was given three times daily and gradually increased to two grains. It was stopped on the 18th, the patient complaining of specks in front of his eyes and palpitation. During this time he had short attacks, lasting a few minutes, in which the pulse-rate rose to 60–70, but they distressed him, and we were never able to cardiograph him in one of these periods. As no drugs appeared to have any beneficial effect he was from this date given little in the way of treatment. His condition varied little, there were short periods of slight improvement, but on the whole he went progressively downhill. On August 26th he began to have more faint attacks with slight twitching. Adrenalin was tried, but failed to give any relief, and he died on the 29th in an attack. During the whole illness he never had a convulsive attack.

Post-mortem Examination.—This examination, made on the 30th, showed soft recent adhesions of both pleural sacs with old, tough adhesions at the left base, and much engorgement of both lungs with bronchioles filled with mucus. The liver showed a typical "nutmeg" appearance, and the spleen was hard and fibrotic, with a thickened capsule but no infarcts. The pericardium contained some 5 oz. of clear fluid and the heart weighed 21 oz. The heart muscle was hypertrophied and rather pale in colour. Both auricles were dilated, especially the left, in which the endocardium was thickened. There was also slight thickening of the flaps of the mitral valve, but no lesions were noted in the other valves. There were many yellowish-white patches

of degeneration visible in the myocardium immediately beneath the endocardial lining. These patches were most marked in the interventricular septum (Fig. 5) and presumably involved the bundle of His. Unfortunately it was not possible to cut serial sections of the bundle, but isolated sections of one of these yellowish-white patches in the septum showed typical chronic myocarditis with well-marked patches of new-formed connective tissue with fibroblasts.

FIG. 3.

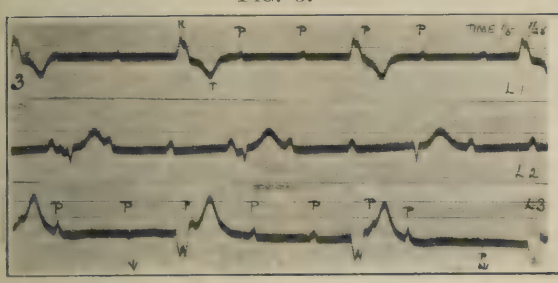

FIG. 4.

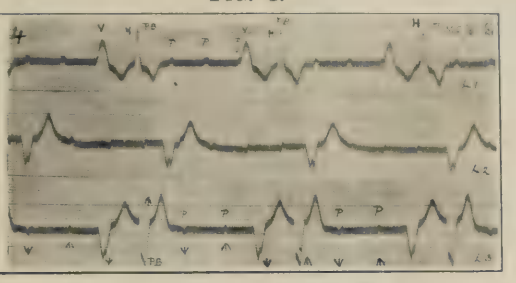

FIG. 3.—Showing unequal periods between auricular beats; some of the latter were inverted, and apparently arose from an ectopic focus.

FIG. 4.—Alternately inverted auricular complexes in lead 3, the rise in rate suggesting possibility of alternate auricular extra-systoles. There was coupling of ventricular beats; the first (supraventricular) beat of the couple showed right-side branch block, following an ectopic beat arising in left side of ventricle. In lead 1 the second beat of the couple apparently arose in the interventricular septum.

Interesting Points in the Case.

The points of special interest in this case are as follows:—

1. The mode of onset, short history, and complete invalidity of the patient. During the whole illness he had to be kept flat, and much of the time had the foot of his bed raised.

2. The very forcible character of the auricular beat at the commencement. In most cases the auricular beat can be heard at the base, but it must be very rare to hear it so plainly at the apex, and still more so to be able to see and feel it in that situation.

3. From the fact that the patient had a bundle branch lesion at the time when there was only delay in the main branch of the bundle we may reasonably assume that the picture is that of a branch block and not that of an ectopic beat arising on one or other side of the ventricle. If the first cardiogram (Fig. 1) had not been seen it would be hard to prove that this latter was not the true reading. It would seem that we must assume two lesions of the bundle system, the upper rapidly involved the main bundle, the lower probably situated near the fork of the branch, so that the extension or recession of the inflammatory area at one time involved one side of the bundle and at another time the other. A simultaneous involvement of both branches may have been the cause of death.

4. The slowing of the auricular rate under the influence of digitalis and the alteration of the auricular complexes as evidenced by inverted P waves in Fig. 3. (Direction of P waves marked in cardiogram by a broad arrow.)

5. The increase of auricular rate 90–130 under the further influence of digitalis. Possibly if the digitalis had been continued the auricle would have proceeded to fibrillation.

6. The notching and diphasic appearance of the P wave whilst under digitalis, which is not to be noted at any other time.

7. The picture of the ventricular ectopic beats stimulated by digitalis. In nearly all cases the idiopathic ventricular beat arises on the same side of the heart as the contraction starts—i.e., the side away from the blocked branch. The normal appearance of the idiopathic beats in lead 1 in association with this double block supports Hewlett's proposition (*Heart*, 1921, vol. ix., 1) that such complexes are an indication of an idiopathic ventricular beat arising in the ventricular septum.

FIG. 5.

Heart of the case described, showing light patches of degeneration in myocardium immediately beneath endocardial lining, being most marked in the interventricular septum, and presumably involving the bundle of His.

Since this article was written an interesting paper on the Action of the Auricle during Periods of Ventricular Silence has been published by Wiltshire.[1] His graphs show gradual failure of the auricle, ectopic auricular beats, and periods of auricular flutter. Other cases have been published showing auricular fibrillation as a sequel to complete block. In the case recorded the auricular beat remained regular and constant except as a result of the administration of digitalis, when slowing of the rhythm and ectopic beats gradually appeared. It would appear that the piling up of stimuli unable to pass the bundle is one factor which may produce alterations in the auricular rhythm, flutter, or fibrillation.

We have to thank our colleagues Dr. W. J. Hadley for access to the case and permission to publish these notes, and Dr. F. G. Chandler for use of the out-patient notes.

[1] Heart, 1923, x., 2.

THE CRITERIA OF CURE IN TUBERCULOSIS OF THE GUINEA-PIG.

WITH SPECIAL REFERENCE TO DIAPLYTE ANTIGENS.*

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THERE is evidence to show that the majority of individuals possess a good deal of natural immunity against the tubercle bacillus, or are able to elaborate, should necessity arise, sufficient protective substances to overcome moderate degrees of infection. But, on the other hand, when once tuberculosis becomes established the mortality-rate is very high. The treatment of the disease is still one of the most pressing problems in practical medicine, for while no therapeutic agent having a specific action on the bacillus has yet been discovered, immunological methods of treatment have met with only partial success, though since the days of Koch's original tuberculin many forms of tubercle antigen have been suggested.

The literature of tuberculosis is full of the records of experiments dealing with the treatment of tuberculous animals, chiefly guinea-pigs. For the most part the materials employed have not proved satisfactory, but some authors report astonishingly good results. Takeoka,[1] treating tuberculised rabbits and guinea-pigs with taurin, found that they gained in weight as compared with control animals, lived longer, and upon examination presented evidence of arrest or cure of the disease. Koga,[2] working with preparations of copper, also obtained good results, and many other similar experiments could be quoted. It is significant, however, that none of these remedies have found permanent favour in the treatment of human tuberculosis, and it is therefore necessary to scrutinise very carefully the experimental evidence upon which their alleged value is based.

Two assumptions seem to underlie all these experiments: (1) That all guinea-pigs react in the same way to the tubercle bacillus, and (2) that fibrosis, or healing, of local lesions indicate with certainty the cure of the individual. Both these assumptions are false, as I shall hope to show, and the failure to recognise this is sufficient to explain the disagreement between the clinical and the experimental results. (1) The reports of the Royal Commission on Tuberculosis[3] make it clear that individual guinea-pigs differ among themselves in their reaction to *B. tuberculosis*. In one experiment ten guinea-pigs, inoculated with a strain of human tubercle bacilli, died of tuberculosis in periods ranging from 46–151 days. In another, 30 animals inoculated with a slightly virulent human bacillus died in periods ranging from 39–244 days. (2) A knowledge of human pathology throws doubt on the second assumption, for it is a commonplace of the post-mortem room to find fibrosed and encapsuled caseous tuberculous lesions in the lungs or other organs associated with an acute local or generalised exacerbation of the disease, though a careful microscopic examination of such lesions often reveals that an active though indolent form of tuberculosis is present at some part, usually the periphery, of the "healed" focus. These broad facts of human pathology are generally recognised, but pathologists are less well informed about the actual course of tuberculosis in guinea-pigs. These animals are usually only infected experimentally for purposes of diagnosis, and not with the object of studying the actual progress of the disease in them. Therefore, if they are to be used as subjects for the investigation of the therapeutics of tuberculosis, it is essential to establish standards by which it is possible to control the results; for if we have not accurate knowledge of the actual progress of the infection in the normal animal, it is impossible to estimate the value of any particular form of treatment.

The most recent remedy suggested for the treatment of tuberculosis is the defatted or "diaplyte" antigen described by Prof. G. Dreyer.[4] Injected into rabbits, this antigen caused the appearance of various immune substances in the blood of the animals, while used therapeutically on tuberculous guinea-pigs and rabbits it gave encouraging results. In the author's words: "Treatment with the 'defatted' antigen brings about a definite improvement, both general and local, in animals infected with *B. tuberculosis*. Additional evidence for this view is given by the guinea-pig No. 27 which died, for its organs show what seems indubitably to be a healing of tuberculous lesions."

Although the scope of Dreyer's paper extends much beyond the limits of the treatment of tuberculosis, it was this aspect of his work which chiefly aroused interest, and obviously demanded immediate consideration. Now, the final test of any therapeutic measure must be its effect upon the health of the average patient. No demonstration that, by all the rules, it ought to cure the patient is of any avail unless, in fact, it does; for, as Calmette[5] says: "Antibodies cannot be regarded as the essential element in the defence against tuberculous infection." Therefore that part of Dreyer's paper which deals with the actual treatment of tuberculous animals transcends in importance the larger, serological part, interesting though this is, and I do not propose to discuss either the general immunological considerations raised by him or the intrinsic merits of the diaplyte antigen.

The Evidence for the Value of the Diaplyte Antigen.

It is, of course, notoriously difficult to estimate the value of a therapeutic agent, for the control of the various factors in the experiment may be quite impossible, and it would be unsafe and unjust to condemn any form of treatment on clinical evidence alone without giving it an extended and sympathetic trial. On the other hand, we may justifiably demand that there should be reasonable grounds for believing the treatment to be efficacious before we are asked seriously to consider it. A critical examination of Dreyer's paper provides really little evidence of the value of his antigen as a curative agent. The rabbit experiments scarcely need to be considered, for the details given are much too meagre to enable the reader to form a definite opinion of the value of the treatment, and, further, that animal which showed the most severe lesions was chosen to be the control.

Duration of Life.—The four guinea-pigs used were inoculated with a culture of low virulence which, it is stated, usually killed the animals in from four to ten months with generalised tuberculosis. Two, Nos. 27 and 28, were the survivors of a batch inoculated on April 20th, 1922, while No. 26 was probably infected about this date. No. 4 was infected on June 15th, 1922. One animal died 50 weeks after infection, but the others were alive on May 18th, 1923, and had therefore lived longer than the general run of animals infected with this particular strain of bacillus; though not, so far as we know, longer than it is possible for untreated animals infected with this particular strain to survive, especially if we suppose, as it is not unreasonable to do, that they were specially well cared for. In these experiments improvement was noted in the condition of the local lesions, and the palpable glands diminished in size, but this is not conclusive, for it may happen in untreated animals which survive for any time, and is not an indication of actual cure.

Weight.—Dreyer lays stress on the weight of the animals as an indication of their general health. "In an animal of this species, the weight is the best indication of the general condition of health." One of the animals became pregnant, and its weight is not recorded. Of the others, No. 4 weighed 630 g. at the beginning of treatment, and 946 g. after 20 weeks, the end of the period recorded, an increase of 50 per

* Being a paper read at the Pathological Society of Great Britain and Ireland on Jan. 4th. This work was done under a research grant from the Medical Research Council.

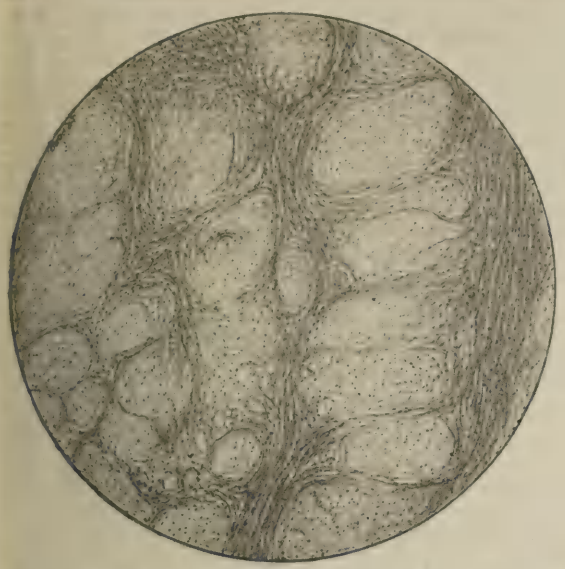


FIG. 1.—Tracheal gland. Guinea-pig No. 10, 5A. Showing extreme fibrosis and areas of endothelial proliferation.

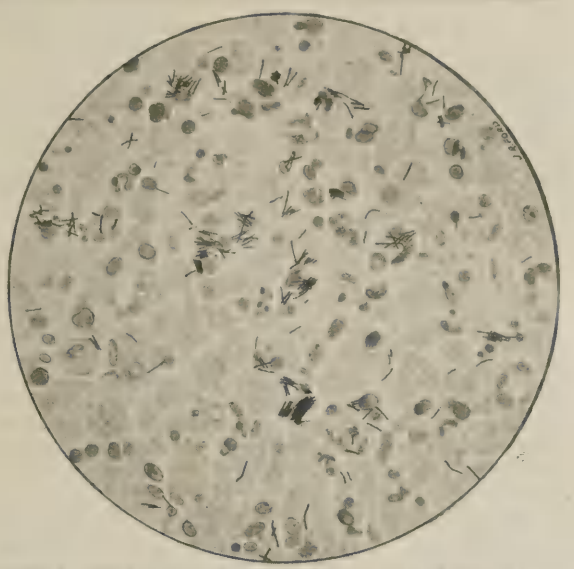


FIG. 5.—High-power drawing of the centre of the largest focus in Fig. 4. Showing contents of abscess with large numbers of tubercle bacilli.

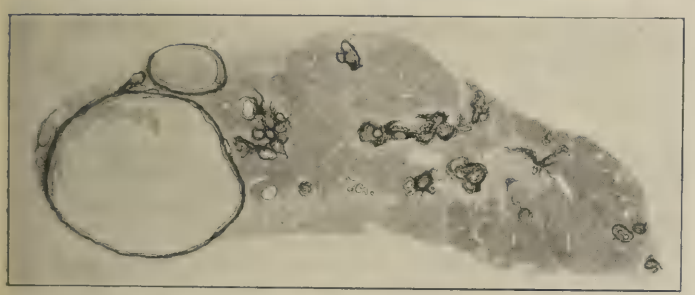


FIG. 2.—Low-power drawing of a section of the liver from guinea-pig No. 10, 5A. Showing cystic dilatation of bile-ducts and coarse fibrosis.

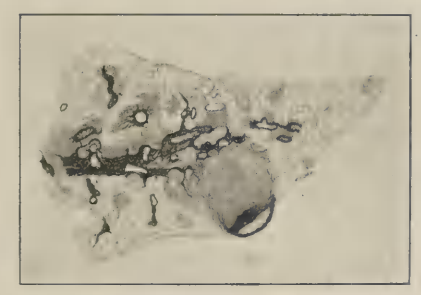


FIG. 4.—Low-power drawing of a section of the lung from guinea-pig No. 10, 5A. Showing fibro-caseous tuberculosis.

FIG. 3.—Higher magnification of Fig. 2 including part of the wall of the large cyst. Showing extreme fibrosis with destruction of liver tissue and dilatation of bile-ducts. There is some new bile-duct formation which is often a prominent feature in these livers.

cent. No. 26 weighed 813 g. at the beginning of the 16 weeks' treatment, and 840 g. at the end, an increase of 3 per cent.; while No. 28 lost 34 g., or 6 per cent. of its weight in the same time. Quite as favourable results as these may be seen in untreated animals. Finally, one of the animals died, and was subjected to careful naked-eye and microscopical examination. It showed lesions which were interpreted as indicating a tendency to healing. But no description of similar investigations of untreated guinea-pigs are given for comparison, and the results which I have obtained lead me to believe that these findings may occur equally well in untreated tuberculised animals.

Object of Present Experiments.

The author's authority, however, combined with the support of other workers, gave reason to believe that a more potent immunological agent was now available, and my experiments were undertaken with the object of studying the differences in the tissue reactions between treated and untreated animals. I was not hopeful of actually curing tuberculous guinea-pigs, because the experiences of vaccine therapy suggest that dosage is the all-important factor, and I did not expect to be able to regulate the treatment successfully except after a considerable period of trial and error; but I hoped to produce such alterations in the tissue reactions in the animals, possibly in an unfavourable direction, as might be a help to me in the line of work upon which I was engaged. My experiments have not hitherto been successful in this respect, but they have brought out very clearly the need for a radical change in the generally accepted standards by which failure or success of therapeutic experiments on tuberculous guinea-pigs are judged.

Turning to the actual experiments on which these conclusions are based, in the first two, 5A and 6A, I used a strain of human tubercle bacilli given me by Dr. W. E. Gye, and the antigen employed was No. 58, given me by Captain S. R. Douglas, who himself had received it from Dreyer. Experiment 11A was carried out with bacillary emulsion and diaplyte antigen prepared in the Inoculation Department of St. Mary's Hospital, and the animals were infected with the "Lyons" strain of human bacilli obtained from the same source. The first experiment was completed, the second far advanced, when Captain Douglas, who in the meantime had himself been working with antigen 58, informed me that he had come to the conclusion that it was not an entirely satisfactory sample. As tests of the value of the antigen in treatment these experiments, therefore, do not carry any particular weight, but as I have explained, I should not in any case be prepared to pronounce judgment on any therapeutic agent without a much more prolonged trial, and I am quite content to regard all the animals in these two experiments as controls.

General Plan of Experiments.

The general plan of the experiments was as follows. The guinea-pigs were inoculated in the right flank with a fine suspension of tubercle bacilli in normal saline. Care was taken to ensure that the suspension was uniform, so that approximately the same dose was administered to all the animals in each particular experiment, but no attempt was made to determine the actual number of bacilli introduced. Animals of varying weight were chosen purposely, so as to compensate as far as possible for the lack of absolute knowledge of the appropriate dose to be administered. In each experiment the animals were divided into approximately equal batches, one of which served as the control. The treated animals received at intervals of usually a week, subcutaneously into the left flank, a dose of antigen corresponding roughly in amount to the dose used by Dreyer in his experiments. For the most part, the animals have been allowed to die naturally, but some were killed, either because they were obviously very ill or for histological purposes. The animals were weighed, and their weight was charted, usually at weekly intervals. Careful post-mortem examinations were made in every case, and, as a routine, the local lesions, the iliac, periportal and tracheal glands, the livers, spleens, and lungs were microscoped; other tissues and glands were cut where it seemed advisable. The animals invariably developed large local lesions which ulcerated after three or four weeks and discharged caseous material. Only in one or two cases did these ulcers completely heal, though occasionally they diminished to the size of a millimetre or so. Even the healed ones broke down again before death occurred, and the most usual lesion was a dry granulating area, sometimes covered by a scab.

Inasmuch as I was merely concerned with the study of the tuberculous lesions, I have made no general bacteriological examination of the animals, and it is quite possible that many of them died of intercurrent infection; indeed, this is obviously what happened in the early deaths occurring in Experiments 6A and 11A.† But every guinea-pig infected with living tubercle bacilli presented progressive tuberculosis post mortem. Usually the post-mortem findings had a monotonous sameness. The iliac, periportal, and tracheal glands were invariably affected, as were often the left inguinal, the right axillary, and the cervical glands. The left axillary glands were less often involved. The lungs, livers, and spleens were always affected, though to a varying degree. Great enlargement of the liver and spleen with massive infarction were very general findings. It is hoped that the charts of the experiments appended are sufficiently self-explanatory as to make detached description unnecessary, and only points of particular interest will be dealt with.

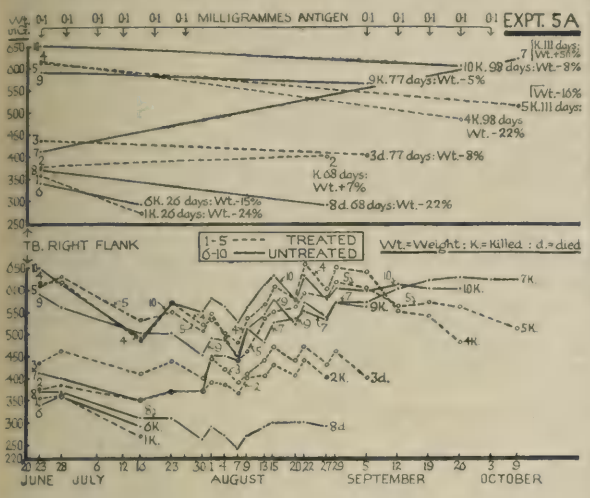
Details of Experiments.

Expt. 1 (5a) (Chart 1).—Ten guinea-pigs were inoculated in the right flank with tubercle bacilli, and five of them (Nos. 1–5) were treated with weekly injections of antigen into the left flank; Nos. 6–10 were controls. During the experiment all the animals lost weight except two; No. 2, a treated animal killed 68 days after injection, gained 7 per cent. of its body-weight, while No. 7, which was untreated, had gained 50 per cent. of its weight when it was killed, 111 days after injection. In the early weeks of the experiment all the animals lost weight. This period coincided with a spell of very hot weather, but the main cause of the loss of weight was undoubtedly imperfect feeding. This is well brought out on the chart during August, when the weights were taken on Mondays and Wednesdays. Invariably there was a fall in the weights on Monday, due to lack of care during the week end, but this was made up by the Wednesday. All of the first six guinea-pigs dying or killed showed progressive tuberculosis. The disease was most advanced in No. 8, which was always a weakly animal, but except for some minor variations in the extent to which the different organs were involved, there is little or nothing to choose between the rest. The chief interest centres in Nos. 4 and 5 (treated) and 7 and 10 (untreated); 4 and 5 both lost weight rapidly towards the end, and when killed were found to be extremely emaciated. In No. 4 the lymph nodes throughout the body were very small and hard, the spleen was shrivelled and scarred, and the liver was firm on section and apparently cirrhotic. The lungs were studded with rather small fibrous tubercles.

In No. 5 the appearances were much the same, but the spleen was a trifle larger; the liver contained a small cyst, and in the lungs the infection was more advanced and there was a condition of active sero-fibrinous pleurisy at the left base. Microscopically both these animals showed a very chronic form of tuberculosis with fibrosis and scarring. This is particularly well seen in the lymph glands, though even here small cellular foci are plentiful among the organised fibrous tissue, and small caseous areas are occasionally to be seen. The spleen shows fibrosis with areas of calcification, but active cellular foci are also present, and in these organs, as in the lymph glands, bacilli can easily be found. The hepatic lesions in both animals are very similar, consisting of a coarse portal cirrhosis, with active cellular tuberculous foci. The fibrosis obviously represents the healing stage of a tuberculous inflammation, and is so far advanced as to cause obstruction of some of the ducts, with cystic dilatation of their lumina behind the obstruction. The cyst in the liver of No. 5 is such a dilated bile-duct, but its wall is

† Interesting modes of death which have been encountered are hæmorrhage from an acute gastric ulcer, 6A/16 and 11A/5; and rupture of vessels of enlarged spleen, usually caused by holding animal for inoculation.

largely formed of granulation tissue, containing many tubercle bacilli. Scanty bacilli can also be found in the lesions elsewhere in this liver and in that of No. 4. The lungs in both animals show advanced tuberculosis. Often the lesions are cellular and there is much fibrosis, but there are also large caseous areas. In many parts there are

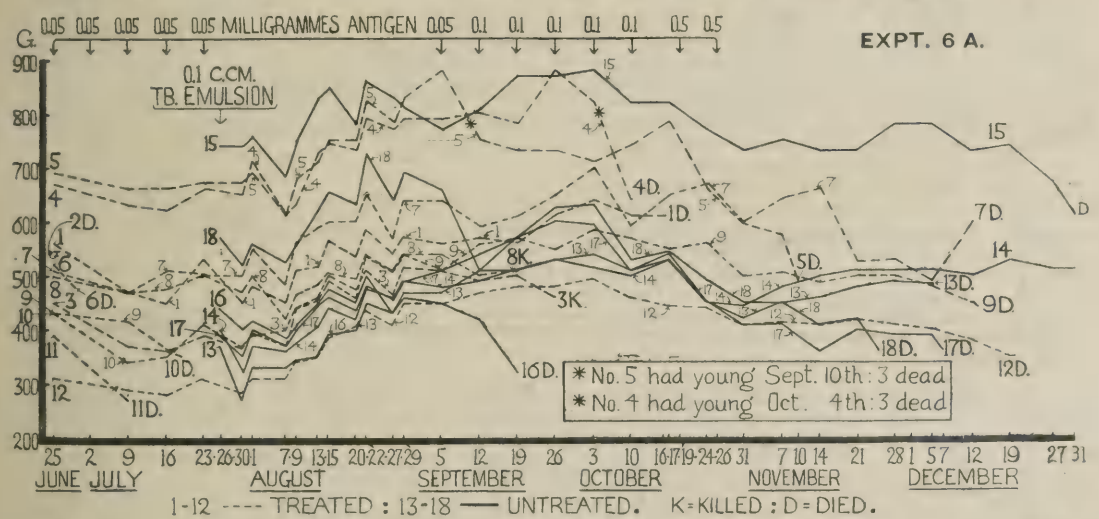


numerous bacilli and at the base of the lung in No. 5 there are enormous numbers of them. In both animals the local lesions were ulcerated, but scarred and fibrous, though tubercles could be made out at the periphery, and the microscopic preparations correspond with these appearances. There is in these animals, then, definite evidence of healing. The local lesions show retrogression and repair, and in other organs it is clear that a much more active and extensive tuberculosis must at one time have been present. Healing in one part, however, is associated with active progress of the disease elsewhere, as is especially well seen in No. 5.

Even more interesting are the control animals, Nos. 7 and 10. In both these the lymphatic glands throughout the body were very large but intensely fibrous, and though bacilli can be found in them they are scanty, and the histology is that of an inflammatory lesion in the healing or fibrosing stage (Fig. 1). In No. 7, which was a well-nourished animal, the lesions in the liver, spleen, and lungs are very similar to those in No. 4, the only practical difference between the two being the much greater size of the lymph nodes in No. 7. In No. 10, however, the fibrosis of the liver noted in Nos. 4 and 5 had proceeded to a much more advanced stage. The liver was considerably increased in size and in its substance and projecting from its surface were numerous cysts (Figs. 2 and 3), containing bile-stained material or clear fluid. Rupture of one or more of these cysts had given rise to a condition of diffuse plastic peritonitis. These cysts are retention cysts of bile-ducts due to the constriction of contracting fibrous tissue. The process is exactly similar to that noted in No. 5, though much more advanced, but I have not found active tuberculosis in any of the cysts in this liver, nor have I found more than a very few bacilli in any of the indolent fibro-cellular lesions which are scattered throughout the organ. It is fairly certain that natural healing was occurring in this liver, though it was at one time much more extensively involved than were the livers of either of the other three animals. Nevertheless, in the lung, which shows microscopically characteristic fibro-caseous tuberculosis (Figs. 4 and 5), active foci with very large numbers of bacilli are present.

Conclusion.—Reviewing the experiment as a whole it may be said that it demonstrates above everything else that fibrosis and natural healing may occur in guinea-pigs infected with tubercle bacilli without any form of treatment at all. But this healing does not indicate more than a local reaction, for in other parts of the body the process is progressive. Inasmuch as the particular sample of antigen used is not regarded as entirely satisfactory, the experiment does not afford data for any expression of opinion as to the value of this form of treatment. If any potency is to be ascribed to the antigen, stress might be laid on the very distinct difference in the involvement of the lymphatic glands in the treated and the untreated animals. But if the treatment is held to be responsible for this, the benefit to the animals is obviously purely local, for the disease is progressing actively elsewhere, notably in the lung of No. 5. If, on the other hand, it is held to that the antigen is worthless, the guinea-pigs Nos. 4 and 5 afford examples of the natural local retrogression of tuberculosis in these animals.

Exp. 2 (6a) (Chart 2).—In this experiment an attempt was made to immunise guinea-pigs before infecting them. Twelve animals of varying weights received weekly injections of antigen for five weeks. At the end of this time four had died, but the eight survivors, together with six controls, were inoculated subcutaneously with a culture of human tubercle bacilli. After an interval of a month the treatment was



continued. By the middle of October four of the treated animals had died or been killed, and the remaining four were given two large doses of antigen, exhausting my supply of the particular sample, which by this time had been discredited. They were subjected to no further treatment. All the animals were allowed to die naturally or were killed when moribund. The weight chart is highly irregular and periodic falls, due to bad feeding, are obvious. It will be noticed how closely these variations correspond in the treated and the untreated animals. If anything, the treated animals appear to have been adversely affected by the antigen: the average duration of life was shorter in them than in the controls, one of which is still alive 158 days after infection, but, on the other hand, there was no immediate response to the two last massive doses of antigen, such as might have been expected.

Conclusion.—The experiment demonstrates how widely individual guinea-pigs may differ in their response to infection with tubercle bacilli. In

all the animals the disease was generalised, but the degree of involvement of the different organs varied considerably in different animals. There is, for example, abundant evidence that tubercle bacilli invariably reached the liver quite early in the infection, yet the hepatic lesions in different animals varied enormously in extent and intensity. And the same picture of retrogression in one place, with active progression elsewhere, is seen in this experiment as in the previous one. One untreated animal, No. 17, resembles in its lesions almost exactly the treated animals 4 and 5 of the first experiment. There is the same shrinking and scarring of the lymph nodes throughout the body, and the same fibrosis of the liver and spleen; but pulmonary foci show enormous numbers of bacilli. Quite often active tuberculosis with demonstrable bacilli can be seen in an organ, together with advanced fibrosis and old caseation with calcification. And a careful examination of the animals in this experiment demonstrates beyond doubt that much more stringent standards of cure must be demanded than have been accepted in the past before cure of tuberculosis in guinea-pigs can be claimed.

TABLE I.

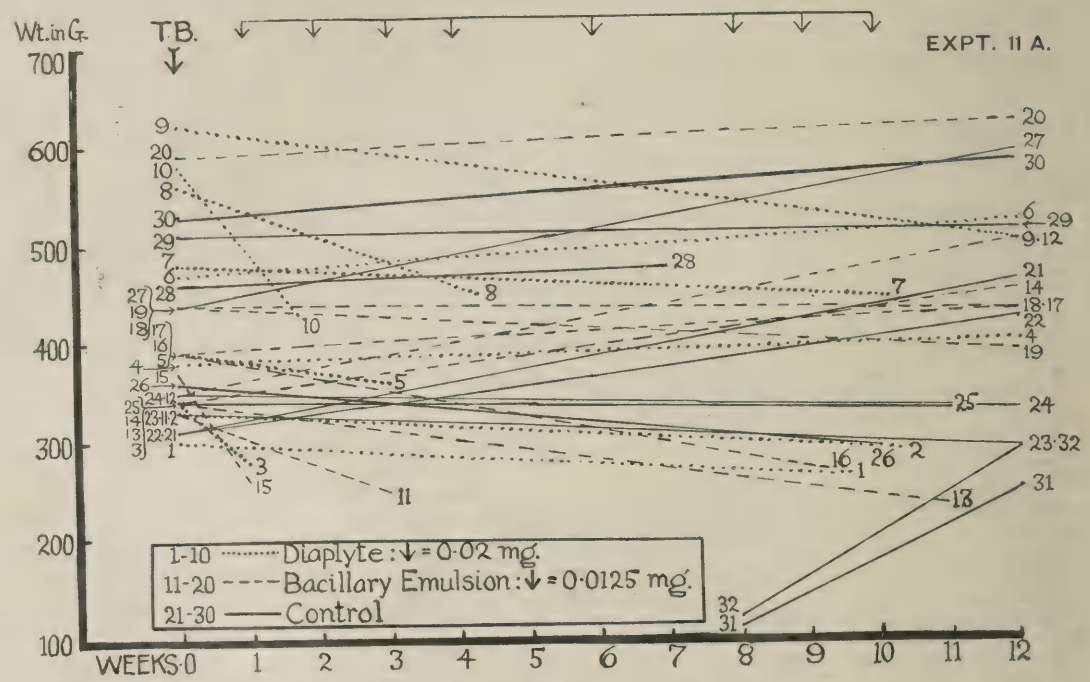
A = diaplyte. B = B. emulsion (tuberculin). C = controls.

—	Average weight in g.		Average loss or gain in g.	Average duration of life. Possible maximum 84 days.
	At beginning of exp.	At end of exp.		
A, 1–10	445	394	−51 (−11·2 %)	53·2
B, 11–20	398	382	−16 (− 4 %)	67·4
C, 21–30	394	424·5	+30·5 (+ 8 %)	78·4

TABLE II.—*Boars Alone.*

A, 1–10	418·7	374·4	−44·3 (−10·5 %)	47·1
B, 11–20	375	346	−29 (− 8 %)	63·0
C, 21–30	364	371	+ 7 (+ 1·9 %)	72·8

Conclusion.—As in the previous experiments, it has not been possible to distinguish absolute differences between treated and untreated animals. The local lesions and the palpable glands in the living animals are all in much the same condition, and no striking differences have been seen in the naked eye or microscopic lesions in those which have died.



Exp. 3 (11a) (Chart 3).—In this experiment 30 guinea-pigs were inoculated with human tubercle bacilli and divided into three equal groups; 1–10 were treated with diaplyte antigen (St. Mary's), 11–20 with bacillary emulsion (tuberculin), and 21–30 were used as controls. Inasmuch as the experiment has only lasted 12 weeks, too much cannot be claimed from it. Adopting the criteria of the duration of life and the body-weight, it will be seen that the best results are in the untreated guinea-pigs, and the worst in those treated with the diaplyte. The differences may be expressed in tabular form by averaging the weights and duration of life (Table I). At the end of 12 weeks 3 animals were alive in group 1, 6 in group 2, and 7 in group 3.

A possible fallacy in Table I. lies in the fact that some of the animals still living are sows, and therefore pregnancy cannot be absolutely excluded, though the animals have been segregated as far as possible. No. 7 when examined was found to contain three very early embryos, and No. 20 gave birth to two healthy animals, Nos. 31 and 32, in the eighth week of the experiment, since when she has been kept in a separate cage. But eliminating the sows, the figures show much the same results, though the figures for the control animals are most severely affected by this procedure. The figures for boars alone are given in Table II.

Evidence of healing can be found in many of the animals, though not to such an advanced degree as in the previous experiments in which the animals were examined at a much later date after infection.

General Survey of Results.

The conclusion which can be fairly drawn from the experiments is that the evidence which is usually brought forward in demonstration of the cure of tuberculosis in guinea-pigs is invalid. Such indications of healing as have been described occur naturally in untreated animals; further, they do not indicate any increased resistance to the tubercle bacillus in the animal itself, for they are local in their manifestations, and are associated with the progress of the disease elsewhere in the body. The original observations in support of Dreyer's treatment are, in the absence of adequate controls, quite inconclusive, and the question whether or not this antigen is of value in the treatment of tuberculous guinea-pigs can only be answered by further experimentation. In my experiments it has not been possible to demonstrate any curative action of the diaplyte antigen. There is, however, a good deal to suggest that the antigen had an adverse action on

the guinea-pigs treated with it, even in comparison with bacillary emulsion. It is possible that a different and favourable result might have been obtained by more careful dosage, although this is mere supposition.

We recognise every day in the post-mortem room healed tuberculous lesions in the caseous but completely encapsuled focus, the calcareous gland, and the scarred and puckered lung. It may be that such a lesion actually contains living and virulent tubercle bacilli, yet if it is securely encapsuled and shut off from the rest of the body it is regarded as a healed lesion. If, on the other hand, a progressive even though slow reaction of the surrounding tissues indicates that the lesion was still active it cannot be said that the patient was cured in respect to this particular infection, for we know from experience the readiness with which such latent foci may light up.

If such stringent criteria of cure are demanded for the human being, there is no reason why a lower standard should be accepted for the guinea-pig, especially when it is remembered that these animals are used in such experiments as have been discussed in this paper actually as indicators.

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2. Jour. Exp. Med., 1916, xxiv., 107.
3. Part II., Appendix, vol. i., 1911, p. 39 et seq.
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5. Tubercle Bacillus Infection and Tuberculosis in Man and Animals, Williams and Wilkins, Baltimore, U.S.A., 1923, p. 561.

SERUM DIAGNOSIS IN SYRIA:

AN ANALYSIS OF 2868 CASES.

BY E. H. R. ALTOUNYAN, *M.C.*, M.D., B.CH. CAMB.

(*Abstract of M.D. Thesis.*)

THE following account is an abstract of work undertaken between 1921 and 1923 to estimate the value of serological tests in syphilis, tubercle, dysentery, typhoid, and typhus for the population in Syria. The clinical diagnosis has been confirmed by Dr. A. A. Altounyan, of Aleppo.

1. *Serum Diagnosis of Syphilis.*

(*a*) *Wassermann Reaction.*—This reaction was tested in 1783 cases, with Rochester Row technique, and heart cholesterin antigen prepared by Dr. E. L. Kennaway. The series under consideration covers a period of two years (1921–23); it includes the sera of 1783 individuals and is exclusive of controls and re-testings. The age of subjects ranges from 11 months to 75 years; all tests were performed by the author, using a uniform technique. The bulk of material was obtained from hospital out-patients; normal sera were obtained from the hospital staff, the free clinic, and in-patients awaiting major operations. In order to economise time and material and to minimise the risk of gross errors, which under the circumstances could not be checked by another laboratory, the reaction was carried out once a fortnight and the number of sera to be examined was maintained at a minimum of 50. In instituting the Wassermann reaction (W.R.) in Aleppo, it was considered desirable to estimate the percentage of positive results likely to be obtained from the routine examination of patients presenting themselves at the hospital. Owing to the great prevalence of malaria, it was thought necessary to endeavour to appraise its effect on the W.R. Of 1263 cases taken from persons not suffering from acute malaria or exhibiting gross signs of chronic malarial infection, 13·5 per cent. were found to give a positive W.R. In two cases in which the blood examination was repeated with contradictory results, no clinical evidence of syphilis was found. In the remainder, the diagnosis of syphilis was substantiated by physical stigmata or the results of anti-syphilitic treatment. This percentage of active syphilitics is comparable to the figures given by workers in France, England, and America. Of 135 cases suffering from obvious signs of chronic malarial infection, 11 per cent. were found to give a positive W.R. It may be assumed therefore that chronic malaria has no appreciable effect on the W.R. Of 21 cases of acute malaria, confirmed by the examination of the peripheral blood, 2 cases, or 9·5 per cent., gave a positive W.R. The anti-complementary phenomenon observed by other workers was well seen in 6 cases (30 per cent.). Of 152 cases taken from the venereal clinics, 48 per cent. gave a positive and 21 per cent. gave a suspicious reaction. These cases were examined as a test of the sensitiveness and accuracy of the general technique. Three cases of leprosy and 1 case of sleeping sickness (*Trypanosoma gambiense*) all gave negative reactions. Eight cases of pyrexia, due to infection with various organisms (non-malarial), all gave negative reactions.

TABLE I.—*Results Obtained in the Sera of 1783 Individuals Examined by the W.R. (Rochester Row Technique) at Aleppo.*

Groups.	No. of cases.	Positive.	Weak positive.	Doubtful.
		Per cent.	Per cent.	Per cent.
I. General	1263	13·5	9·1	—
II. Malarial (chronic)	135	11	12	—
III. Acute malaria ..	21	9·5 (2 cases)	30 (6 cases)	—
IV. Orphanage ..	212	26·8	14	—
V. Venereal clinics ..	152	48	10	11

N.B.—For practical purposes no reading less than "Positive" is considered as significant. In the case of known syphilitics, "Weak positive" and "Doubtful" readings are considered to be indications for the continuance of treatment.

Conclusions.—(1) Chronic malaria has no appreciable effect on the W.R.; (2) acute malaria has an undoubted effect in increasing the anti-complementary powers of the serum (if this is borne in mind, "false" positives will be of very rare occurrence); (3) pyrexia, due to non-malarial infection, has no effect on the W.R.

(*b*) *Sigma Reaction.*—This reaction was tested in 227 cases. Dreyer-Ward technique. Antigen prepared by Dr. H. K. Ward, of Standards Laboratory, Oxford. It was found impossible to carry out a large series of comparative tests by both methods, and in view of the work already published this does not seem to be of first importance. A sufficient number of comparative tests were done, and compared with the clinical findings, to satisfy the author that his interpretation of the technique was approximately correct. The sera of 227 individuals were tested. Of these 67 proved positive and 160 negative; 16 cases of discrepancy between the two methods occurred. In three instances the balance was in favour of the W.R., and in two instances in favour of the Sigma reaction (S.R.). One case of leprosy was returned as positive (2·6 units). A special study was begun on syphilitics under treatment, and the results in 10 cases (involving 52 tests) accord with those published by the Medical Research Council.

Conclusions.—(1) The S.R. appears to be of as great diagnostic value as the W.R.; (2) the technique of the S.R. is simpler, but the reading of results requires greater care and experience; (3) in the study of syphilitics undergoing treatment, the S.R. is undoubtedly the method of choice; (4) in the serum diagnosis of syphilis, workers will continue to use both methods in the elucidation of difficult cases; (5) the possible influence of malaria, leprosy, yaws, &c., requires careful investigation.

2. *The Complement-Fixation Test for Tubercle.*

Technique.—Besredka's antigen,[1] 501 cases. As for W.R. with following modifications: Serum not diluted, complement used 3, 4, 5, 6 M.H.D. Incubation time one hour at room temperature, one hour at 37° C. in incubator. Readings taken at once. The antigen was used undiluted, 1·5 unit volume to each tube. I subjected 501 cases to the complement-fixation test; the results agree in the main with those of

[1] For Besredka's antigen see Annales de l'Institut Pasteur, 1921, xxv., 291.

seven observations by other workers given in Table III. Table IV. compares my results with those of Rieux and Bass, also using Besredka's antigen and working with the same technique. It will be observed that in each case the highest percentage of positive readings is obtained in cases of pulmonary tuberculosis with positive sputa. In each case tuberculous peritonitis cases give low readings. The percentage of "false positives" is approximately the same. There is a striking difference in the percentage of positive results given by cases of pleural and glandular infection.

TABLE II.—*Analysis of the Complement-Fixation Test for Tubercle in the Sera of 501 individuals.*

—	No. of cases.	Positive.	Weak positive.	Negative.	Percentage of positive weak positive.
Pulmonary tuberculosis (sputum positive for T.B.)	23	17	4	2	91
Pleurisy (with effusion) ..	11	9	0	2	82
T.B. abdominal	21	13	1	7	66
T.B. bones	38	28	2	8	79
T.B. glands	29	19	5	5	83
T.B. larynx	5	3	0	2	60
T.B. suspect	98	76	14	8	91
Undiagnosed (? T.B.) ..	37	26	1	10	73
Lupus vulgaris	12	7	3	2	83
Asthma	9	4	1	4	55
Leprosy	3	3	—	—	—
Encephalitis lethargica ..	3	2	1	—	—
Lateral sclerosis	1	1	—	—	—
Typhus	1	1	—	—	—
Typhoid	1	—	—	1	—
Hodgkin's disease	1	—	—	1	—
Small-pox	1	1	—	—	—
Banti	1	1	—	—	—
Rodent ulcer	1	1	—	—	—
Trypanosomiasis	1	1	—	—	—
Albino	1	1	—	—	—
Normal	203	27	23	153	14*

* Including syphilitics, 24 per cent.

TABLE III.—*Results Obtained by Various Workers with the Complement-Fixation Test for Tubercle.*

Author.	Antigen.	Tuberculous.		Non-tuberc.	
		No. of cases.	Positive percentage.	No. of cases.	Positive percentage.
H. Von Wedel.	Wilson's.	484	69·8	539	1·7
Stivelman.	Miller's.	592	52	108	24
Watkins and Boynton.	Miller's.	1103	78	168	4·2
Rieux and Bass.	Besredka's.	156	75	148	11·5
L. Kempner.	Besredka's.	131	82	57	3·5
Sellers and Ramsbotham.	Wang and Crockett's.	85	71	50	0
A. L. Punch.	Fresh bacillary emulsion.	181	100	205	2
E. H. R. Altounyan.	Besredka's.	274	83	203	14*
Average for eight workers ..		3006	76	1478	8

* Excluding syphilitics.

TABLE IV.—*Results Obtained by Two Observers Working with Besredka's Antigen.*

—	Rieux and Bass.		The author.	
	No. of cases.	Positive percentage.	No. of cases.	Positive percentage.
Pulmonary tuberculosis ..	78	98	23	91
T.B. peritonitis	6	66	21	66
T.B. glands	44	45	29	83
Pleurisy	28	57	11	82
T.B. suspect	80	64	98	91
Tuberculous (all cases) ..	156	75	274	83
Normal	148	11·5	203	14

N.B.—These results are strictly comparable except in the class labelled "T.B. glands." The author's cases were all lymphatic infections of the neck, axilla, or groin, while Rieux and Bass's figures are confined to bronchial gland infections.

As an outcome of the experience gained in these cases, I submit the following reflections:—

1. The time allowed for the fixation of complement must be ascertained accurately by experiment for each technique. It can be assumed that this will certainly be longer than that required in the W.R. At present I allow two hours. An extension of this time, as suggested by Aronson and Lewis, would possibly be advantageous. At the same time the percentage of "false positives" obtained (14 per cent.) is already considerably higher than the average. Allowance might be made in the readings in view of the compensating advantages of a more stable fixation.

2. Workers in France, England, and America agree that the highest percentage of positive results is obtained in cases where the diagnosis of tuberculosis is based on the finding of tubercle bacilli in the sputum. Such a conclusion is highly satisfactory. It is, however, to be regretted that the classification of cases according to the site of the tuberculous lesion is not more frequently made.

3. The cross-fixation phenomenon with syphilitic sera is a serious factor in all tests where the Besredka antigen or whole tubercle bacillus emulsion is used. In 29 of my syphilitic cases there were 20 cross-fixations with the tuberculous antigen.

4. The effect of hyperpyrexia on the reaction requires further elucidation. Four cases of the author's (all positive), occurring in the course of typhus, typhoid, small-pox, and sleeping sickness, suggest that this may prove a source of error.

General Conclusions.—(1) It is impossible to say, by a consideration of the general physique, or a detailed examination of the particular focus of disease, whether, in any given case, we are likely to find a plentiful or scanty production of antibodies in the blood; (2) it may be hazarded that, on the whole, we are likely to obtain a strong reaction in an incipient case and a weak or negative reaction in a terminal case of tuberculous infection, but the exceptions to this dogma are many, and reliance on it may occasionally prove dangerously misleading; (3) the phenomenon of the non-specific cross-fixation of complement appears to be due to the employment of whole tubercle bacilli in the preparation of the antigen. On extracting the bacilli with alcohol and ether, the sensitiveness of the antigen may, to some extent, be impaired.

3. *Serum Diagnosis of Chronic Bacillary Dysentery.*

In this series 181 cases were tested, Dreyer's standard cultures of Shiga and Flexner V, W, X, Y, Z being used (incubation four and a half hours in water bath). The classification of normal and dysenteric individuals adopted in the accompanying tables is necessarily arbitrary. Few persons living in the near East escape, at one time or another, an attack of acute intestinal catarrh. The amœbic and bacillary types seem to be about equally prevalent. A "normal" individual is taken as one who at the time of examination (and within recent memory) is not suffering from some chronic intestinal disorder. The "dysenteric" patient is not so classified until he has undergone a thorough examination, including an investigation of stools for amœbæ and parasites, and a search in the blood for malarial plasmodia. In short, persons suffering from chronic intestinal instability in whom malaria, amœbic dysentery, and the presence of large numbers of intestinal parasites have been excluded, are classed for the purposes of this investigation as chronic dysenterics. The longest period of debility in this series is 20 years. The experience gained in one case of two years' standing, cured by the administration of santonin and the expulsion of large numbers of round worms, has led to the routine administration of a vermifuge before proceeding to the more elaborate investigation of any patient.

The comparisons between the normal and dysenteric groups is given in Table V. Taking 10 agglutinin units as the minimum standard of positivity, it will be found that normals show 38 per cent. and dysenterics 74 per cent. of positives. If the sexes are differentiated, it will be seen that females give a considerably higher percentage of positives (both in the dysenteric and normal group) than males.

In the dysenteric group, the relative importance of the types of bacillary infection is shown in Table VI.

It will be observed that Flexner Y is by far the commonest, and then W, while V, X, Z and Shiga occur with about equal frequency. On contrasting the normal and dysenteric groups in respect of the six types of dysentery bacilli, we observe (1) that over 10 agglutinin units obtained with Flexner W or Y may be regarded as suggestive; (2) that Flexner Z is very rarely met with in the normal group; (3) that reactions to Flexner X occur in about the same proportion with normal and dysenteric sera.

TABLE V.—*Number of Cases Giving 10 Units and over with any one of Six Types of Dysentery Bacillus (Shiga and Flexner Group).*

—	No. of cases examined.	No. of cases giving 10 units and over.	Percentage of cases giving 10 units and over.
Normal cases (both sexes)	112	43	38
Dysenteric cases (both sexes)	67	50	74
Normal male cases	63	21	33
Dysenteric male cases	27	15	55
Normal female cases	49	22	44
Dysenteric female cases	40	35	87

TABLE VI.—*Percentage of Cases giving 10 Agglutinin Units (and over) when tested against* B. dysenteriæ, *Shiga and Flexner V, W, X, Y, Z respectively.*

Analysis of 181 Cases.

Male and female.	Normal.		Dysenteric.	
	No. of cases.	Percentage.	No. of cases.	Percentage.
B. dys. Shiga	5	4·5	10	13
B. dys. Flexner—				
V	5	4	9	13
W	13	11·5	23	35
X	16	14	10	16·6
Y	23	20	33	57
Z	2	1·7	11	16

Conclusions.—(1) The standard agglutination tests with the Shiga-Flexner group of dysentery cultures, though primarily designed as a supplementary aid in acute and subacute infections, may have a large field of usefulness in helping to determine the prevailing type of infection in the dysenterics of any given population; (2) that such an investigation may prove to be of more than academic interest is suggested by my experience in a few cases treated by dysenteric vaccines made up of organisms corresponding to the prevailing types (Thomson's detoxicated vaccines); (3) it is possible that the standard agglutination tests may be of value even in the diagnosis of chronic dysentery; though the series of single tests reported by the author is not, and cannot be, conclusive, yet it is reasonable to suppose that repeated tests on the same individual, in a large number of cases, may enable one to formulate some working hypothesis as to the relative significance of slight irregular variations in agglutinin values, obtained with a particular organism, in any given individual.

4. *Serum Diagnosis of Typhoid.*

In this series of 107 cases, Dreyer's standard cultures of *B. typhosus*, *B. paratyphosus* A and B, *B. enteritidis* Gaertner, and *B. aertrycke* were used. Incubation two hours.

1. Of 56 normal controls significant agglutinin values were recorded in 3 per cent. of cases. Of 51 cases of clinical "typhoid fever" 78 per cent. gave high agglutinin values with *B. typhosus* cultures, and there were four cases regarded as due to paratyphoid infections.

2. A consideration of Table VII. suggests that the population as a whole shows signs of having recently passed through a paratyphoid epidemic (probably paratyphoid B). There is a certain amount of evidence to prove that in the presence of an active *B. typhosus* infection paratyphoid agglutinins of a value which would not ordinarily be regarded as significant are raised and in some cases attain a value far exceeding that produced by the active infection.

3. A further consideration of these tables leads one to think that what is true of paratyphosus B is also true of the *B. enteritidis* Gaertner. It becomes apparent that there is a considerable Gaertner infection of the general population and that infection with *B. typhosus* raises considerably the value of its agglutinin residues.

TABLE VII.—*Agglutinin Values obtained with* B. typhosus, B. paratyphosus *A and B*, B. enteritidis *Gaertner, and* B. aertrycke *in 56 Normal Individuals and 57 Cases Diagnosed as Typhoid.*

Group.	Cultures.	No agglutination.		2–5 units.		5–10 units.		10–20 units.		20 units and over.	
		C	%	C	%	C	%	C	%	C	%
N	*B. typh.*	49	87	5	8·9	0	—	2	—	0	—
T	*B. typh.*	4	7·8	3	—	4	7·0	13	27	27	57
N	*B. Para.*	55	98	0	—	1	—	0	—	0	—
T	*typh.* A.	45	88	0	—	0	—	3	—	3	—
N	*B. para.*	50	89	3	—	3	—	0	—	0	—
T	*typh.* B.	41	80	1	—	0	—	1	—	8	17
N	*B. enter.*	49	87	0	—	5	8·9	2	—	0	—
T	Gaert.	40	78	0	—	3	—	4	7·8	4	7·8
N	*B. aer-*	53	94	0	—	0	—	3	—	0	—
T	*trycke.*	45	88	0	—	2	—	3	—	1	—

C = Cases. N = Normal. T = "Typhoid."
B. typh. = *B. typhosus.* *B. enter.* Gaert. = *B. enteritidis* Gaertner.

Note.—Of the five normal cases showing 2–5 units with *B. typhosus*, one is known to have had enteric ten years previously. Of the two normal cases showing 10–20 units with *B. typhosus*, one had a severe attack of typhoid five years previously, and the other six years before. Both were members of the hospital staff and were examined in the general course of routine. Neither give any signs or symptoms of ill-health. Stool cultures were not made. The remaining four cases giving 2–5 units with *B. typhosus* have not been accounted for.

4. The significant agglutinin value may be regarded as being one of a minimum of 10 units, though undoubted "typhoid" infections may occasionally register, even at an advanced stage of the disease, considerably lower readings.

5. Though positive hæmocultures were only obtained in five cases, in two of these it was the only means of distinguishing by a single test between typhoid and paratyphoid infections.

6. The coagglutination of *B. paratyphosus* B with *B. aertrycke* is very noticeable.

Summary.—(1) Even in populations where typhoid is endemic (as in Syria) single agglutination tests are of considerable value in diagnosis after the eighth day; (2) the phenomenon of coagglutination requires further study; (3) it is desirable in any investigation of the enteric group that agglutination tests should be made with as many organisms as possible.

5. *Serum Diagnosis of Typhus, Weil-Felix Reaction (B. Proteus X 19).*

Sixty-nine cases were taken from a small epidemic originating among Greek refugees in the autumn of 1922. The general population (immunised by the epidemic of 1916) escaped lightly. Dr. N. Ishkhanian interested himself especially in the working out of the technique, and many of the sera were collected by him at personal risk and inconvenience.

Technique.—1. The blood was collected in agar-lined tubes (A. D. Gardner's technique), according to the author's modification of Thompson's method. 2. The culture used was procured from the Lister Institute collection of type cultures. It was labelled Lister 67. In the laboratory it was maintained by sub-culture once a month at room temperature, after a preliminary 24 hours' incubation at 37° C. For the emulsion a fresh 18 hours' growth on agar was employed. 3. Bacillary emulsion: At first fresh emulsions of the live organisms were used, of an opacity corresponding to that of the standard cultures. Latterly it was found that emulsions of bacilli killed by exposure for one hour to 60° C. remained sterile, and preserved their sensitiveness for two months at least. All attempts to secure formalinised emulsions corresponding to the standard cultures failed. It was repeatedly found that

within a week such an emulsion would fail to agglutinate with even strong positive sera. 4. Dreyer's macroscopic technique was adopted throughout. 5. The time and range of temperature allowed for agglutination are important factors in the test. It was eventually decided that the best results were obtained by three hours' incubation at 37° C., followed by two hours at 54° C., the readings being taken next morning. 6. Controls: As it was impossible to obtain permanent emulsions of stable sensitiveness, special attention was given to checking the sensitiveness of each culture for each test by the use of the following controls: (*a*) A normal serum was tested in a 1 : 25 dilution. If agglutination occurred, then that particular batch of emulsion was rejected; and (*b*) the pooled serum of 10–15 typhus patients, known to give a strong agglutination titre, was preserved (in capsules and a series of small bottles) mixed with an equal volume of pure glycerine. Of this stock a 1 : 250 dilution (=1 : 125 of pure serum) was put up with each batch of sera to be tested. An emulsion was considered satisfactory if complete sedimentation took place in the tube containing the stock serum.

Results.—1. Of 57 typhus patients examined by the Weil-Felix reaction, 3 proved negative. Of these, 1 was lost trace of, 1 was examined after the crisis, and 1 proved positive on re-examination on the tenth day. The earliest authenticated day on which the reaction was obtained is the fifth, the latest four weeks from the onset. The highest effective dilution was 1 : 5000, the lowest 1 : 50. A large proportion reacted in dilution of 1 : 250 and more. 2. Of the 9 cases recorded as controls, there was one case of a doubtful reading (dilution 1 : 50) in a normal individual. In 3 cases of typhoid a negative reading was given. (It must be stated that many more normal controls than those given here were actually carried out, as it was the practice to include in each batch of tests at least one normal individual.) 3. I was unable to confirm the observations of K. Bauer on the effect of typhus serum on the W.R. 4. The effect of typhus serum on typhoid organisms was investigated in 3 cases with negative results.

Note.—The strength of the reaction does not correspond to the gravity of the disease. Mild cases may give strong reactions, but a high reading was also obtained in a patient shortly before death. There is no authenticated case in the literature of diagnosis having been made serologically before the fourth day. It should be possible for workers in countries where typhoid is endemic to ascertain the precise influence of typhoid agglutinins on *B. proteus*.

My thanks are due to Drs. Thoulons, Maire, Borel, and Chopin, of the French Medical Service; to Drs. Sabri Farah and Lutfi, of the Aleppo Venereal Clinics; and to Drs. N. Ishkhanian and P. Hovnanian for the supply of interesting clinical material. Dreyer's technique was carried out by Miss Bayramian and Miss Setyan working in the hospital laboratory. Much valuable advice was given by Dr. A. D. Gardner, of Oxford University.

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Medical Societies.

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF MEDICINE, PATHOLOGY, AND THERAPEUTICS.

THE USES AND LIMITS OF VACCINE-THERAPY.

THIS subject was discussed at a combined meeting of the Sections of Medicine, Pathology, and Therapeutics. Dr. A. J. CLARK, President of the last-named section, occupied the chair.

Sir ALMROTH WRIGHT, in introducing the discussion, said it was always necessary to decide what was the value of an inoculation, and in dealing with a particular patient, the question arose whether a vaccine would do him any good—i.e., whether a stated dose of the vaccine would have any good effect. It really became a matter of making a complete immunological diagnosis as to the dimensions of the infection rather than of the particular site involved. In a septicæmic case one required to know whether the patient had the power of making an active response to a vaccine. In most cases one had not very exact details as to the amount of response to infection, hence it was necessary to employ indirect inference. The experienced mind with a broad vision recognised that typhoid and anthrax were diseases of the same kind—namely, diseases in which the infecting microbe got into the blood, therefore what would work in one case would probably work in the other also. As living microbes, when injected, acted only after they had been dissolved, it was clear that dead microbes could be used with the same effect as living microbes. The mind which refused to accept laboratory results, or which believed nothing that was not evident to the naked eye, was not of any help in devising new methods. Yet laboratory work showed that when dead microbes were injected into a patient the power of his blood could be increased a thousandfold. Indirect inference was better than direct, because details of cases varied so enormously, not only in regard to the strength of the infection, but also the local condition of the patient and his power of resistance. One could not say that because a hundred cases of phthisis apparently similar acted in a certain way, therefore the hundred and first would so act. In regard to the dose of vaccine, it was necessary to have a general outlook. It was known that a healthy man could stand a very large dose of any vaccine and could respond to it; therefore, if one had a man who had no microbes, he could be expected to respond to a big dose; but if he already had some microbial invasion he had, when an injection was made, to deal with two quantities—those he already had in his body and those injected, and he became sick. For that reason the dose for an infected man had to be smaller than that for a healthy man. The importance of diagnosing the volume of the patient's infection thus became paramount. There was a great need to standardise antistaphylococcic serum; many attempts were being made to do this, but he believed none had yet succeeded. Recently, immuno-transfusion had been carried out—i.e., blood was withdrawn from a donor and introduced into the patient with the idea of supplying the latter with the protective substances he was no longer able to manufacture for himself. This was a valuable method, though it, of course, had its limitations. One valuable fact had emerged—namely, that inoculation of a substance which had a specificity to a particular disease, also produced substances protective for other diseases. That might be regarded as a provision of Nature, for it would be a large order to provide specific substances for each separate disease. He believed it should be possible, in the case of a patient seriously ill with pneumonia, to hasten, by inoculation, the crisis and the recovery, instead of waiting for Nature to bring it about in a more leisurely fashion. To do that it would be

necessary to ascertain what was the patient's critical dose. With regard to tubercle, it had been found, in the last six months, that it was a very easy matter indeed to grow tubercle bacilli in the blood, and in enormous numbers. He thought the future treatment of tubercle would be along cataphylactic lines.

How should one judge of results? Most people would answer, by statistics. But statistics, to be complete, needed to be so many-sided that it was difficult or impossible to carry away any general impression from them. Really, one tested most by experience of cases, history, examination, control, after-care. If a desperate case got well, one was justified in attributing the result to one's treatment.

Preventive Inoculation.

Sir WILLIAM LEISHMAN said he had but little first-hand recent knowledge of vaccine-therapy to offer. He had had a fairly large experience in preventive inoculation, and what one learned in that regard was very useful in the use of vaccines for the purposes of treatment. Not only had preventive inoculation been used against typhoid, but also against influenza, especially in the last big epidemic of it. Probably, however, it was not the bacillus of Pfeiffer which was responsible for this disease, but some ultra-visible virus. A vaccine containing streptococci and pneumococci played a great part in prevention. He reserved his opinion as to the value of sensitised vaccines, lipo-vaccines, sero-vaccines, detoxicated vaccines, &c. The effort was to extract from the germ concerned the immunising agent with as little damage as possible, to free it from its toxic ingredients which caused severe reactions and were of no use in immunising, and to get the essential substance in a condition in which it could be easily manipulated and the dosage standardised. He saw no reason for departing from the method of subcutaneous inoculation; the oral method had not yet been clearly settled. Bacteriologists could not feel very happy about vaccine-therapy largely because of the methods by which material was prepared for investigation and the production of vaccines. Often the material was sent by post to a bacteriologist or to a research institute; there was a short statement as to what the patient was suffering from, and a request was made for a vaccine to be at once prepared. The conditions under which the material was prepared were not known and it might have been a long time in transit, perhaps it suffered extremes of temperature, which killed off the sensitive microbes, and the worker found a vigorous microbe surviving, which he cultured, but which was not, probably, the causal factor of the patient's condition.

Dr. W. GORDON pointed out that, especially in acute cases, the dose of vaccine very frequently given was excessive, and hence was dangerous. He related five cases in which that was strikingly borne out. In his first case death nearly followed the use of an ordinary dose. It was that of a man with streptococcal septicæmia, the organism being grown from his blood. He was given a quarter of a million, and no bad results ensued. Forty-eight hours later half a million were given, and within four hours of the second dose his syncope was so bad that he nearly died. In a second case—streptococcal infection of lung—the same initial dose was given and there was no bad symptom. In view of the other case, a 72-hour interval was observed, and another quarter of a million given, and within four hours he had a similar attack of syncope to the other case. To the remaining cases he gave only 40,000, and the results were quite satisfactory.

Dr. A. P. BEDDARD said that in England the chief prophylactic use of vaccines was in catarrhal conditions of the respiratory tract. His experience was that the more nearly a case was to being a chronic carrier of the infection, the more difficult was it to get any good result from the use of vaccine. He had found a mixed autogenous vaccine superior to a stock vaccine, and it was important to ascertain the bacteriology of the pharynx as well as of the sputum. In a case of a series of outbreaks of streptococcal lobar pneumonia he had been able to abort the attacks by subcutaneously injecting at once a 100,000 dose of autogenous vaccine, followed in 12 hours by a double dose. A difficult class of case was that where infection was in one of the tubes of the body, and, to a less extent, that applied to the respiratory tract; and the difficulty of getting a successful result in those cases was enhanced if obstruction also was present. Many of the failures ascribable to vaccine-therapy he regarded as more or less avoidable. The full bacteriology of the case might not have been ascertained. Or the dosage might be at fault. Too often dosage was determined by rule of thumb based upon apparently similar cases. It was especially difficult in acute cases to get the right dose. Another cause of failure was neglect of local treatment and the presence of mechanical defects. Yet after all these causes had been eliminated there were a number of cases in which the treatment by vaccines as ordinarily carried out was inappropriate in one class and uncertain in the other; and if Sir Almroth Wright's newer method of tackling these cases fulfilled its promise, it would mark yet another advance among those associated with his name.

Vaccination in Chronic Colds.

Dr. GORDON MCKASKIE gave his experience of vaccination for people who suffered from chronic colds. He advocated that the specimen should be incubated as soon as it was obtained; otherwise the more delicate organisms might die out. For that reason it was best to collect the specimen in a bacteriological laboratory. In most of his preventive inoculations he had secured complete immunity, and when patients feeling the symptoms of a cold coming on were injected, the cold was aborted in 24 hours. He had used vaccines extensively also in chronic diseases. In infective arthritis, after removing the obvious source of infection, he had had good results. But in chronic bronchitis his results had not been satisfactory, though in one or two cases in which streptococci were present there was improvement. He had noted no effect in cases of surgical tuberculosis. The opsonic index was now known not to be the valuable criterion in treatment that had been expected.

Sensitised and Raw Vaccines Compared.

Dr. R. ARMSTRONG said that during the last few months he had been making a careful comparison of the properties of the sensitised with those of the raw vaccines, using the pneumococcus for the investigation. He used equal doses of each in rabbits, and estimated the antibody content of the sera. As a result of administration intravenously of sensitised vaccine there was a speedy and complete elaboration of the antibody charge of the vaccine. The stage of diminished immunity persisted for a day, and then slowly immunity developed; at the end of the third day it had only attained 0·6 of the lethal dose for a mouse, but by the sixth day there was a dramatically large increase in the immunity. In the case of the administration of raw vaccine, however, the immunity persisted unchanged for many days. In the case of sensitised vaccines it was far different when giving a course; active immunity was deferred until the seventh day, and its degree was tremendously reduced. He thought this cancellation effect could be explained by successive neutralisations of the doses of sensitised vaccines. This research seemed to show that the profession was, as yet, merely on the threshold of treatment by vaccines. He agreed that the old-fashioned subcutaneous injection of heat-killed vaccines was the most valuable reagent possessed for producing active or passive immunity at present, and more work was needed before embarking on the extensive application of sensitised vaccines, especially in acute infections.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

NEPHRITIS.

A MEETING of this Society was held on Dec. 7th and 14th, when a discussion took place on nephritis, with special reference to the physiology and pathology of the kidney. The discussion was opened by Prof. E. P. CATHCART, who gave a brief survey of the modern views with regard to the physiology of the kidney and its function. He referred particularly to the "filtration re-absorption" theory of urinary excretion and also to the part played by the kidney in the regulation of the hydrogen-ion concentration of the body fluids.

Prof. J. SHAW DUNN (Manchester) prefaced his remarks on the morbid changes in the kidney in nephritis by referring to two important conceptions in the study of these changes. The first was the conception of the glomerulus and tubule as a unit of renal structure from the anatomical point of view. Any damage to a glomerulus which produced changes quantitative or qualitative in its filtrate must also affect the function of the tubule; while any disturbance of the vessels of the glomerular tuft must affect the blood-supply of the tubule. The second conception was that of reserve function. The destruction of a large part, or the whole, of one kidney by a gross lesion such as tumour or tuberculosis was rarely followed by any evidence of renal inefficiency; and this was true also in some of the more diffused lesions of nephritis. Thus the clinical picture might give an imperfect indication of the extent of severity of the kidney lesion. The morbid histology of the various forms of nephritis was then described in detail.

Prof. T. K. MONRO gave a brief historical survey of the various conditions included under the term nephritis and referred to the classification into three types, one acute and two chronic. He inclined to the opinion that the secondarily contracted kidney—the chronic form of nephritis following on an acute attack—was perhaps the commonest form met with now in hospital practice. The features, clinical and anatomical, were intermediate between those of the large white kidney and those of the small red kidney. He went on to describe in detail the clinical and pathological features of these various types, referring particularly to the relation of the acute and chronic stages; and drew attention to the acute case which represented an exacerbation of an underlying chronic disease and also to the fact that apparent recovery from an acute attack might result in the return of the patient later with evidence of chronic disease. He then discussed the relation of the arterio-sclerotic kidney—admittedly of vascular origin—to the small red granular contracted kidney and pointed out that, though the latter might yet be found to be of arterial origin, the two conditions were clinically quite distinct.

Dr. ETHEL CRAWFORD described in detail the results of renal efficiency tests which had been carried out in a series of cases in the Royal Hospital for Sick Children, Glasgow. The children were under 13 years of age and were all suffering from inflammatory lesions. Three tests were selected for comparison: (1) The phenolsulphonephthalein test, (2) the urea-concentration test, and (3) the urea content of the blood.

Pigment Test.—In acute cases the excretion averaged 48 per cent.—generally low at onset but increasing as the symptoms subsided. In chronic cases—three months or longer—the average was 57 per cent. In a control series of 26 normal cases the excretion averaged 67 per cent. The test was found to be of no prognostic value.

Urea-Concentration Test.—In acute cases the average was 2·1 per cent., in chronic cases 2·8 per cent. The results of this test were found to be very misleading unless taken in conjunction with the urea content of the blood.

Urea Content of the Blood.—In acute cases the average was 76·6 mg. per 100 c.cm. In chronic cases 37. In normal controls the average was 39. It was high at the onset of the disease and remained high in acute cases, but diminished as a rule as the condition improved. This test was no guide to prognosis nor was it commensurate with the severity of the symptoms.

In general, Dr. Crawford said, these tests do not give any more definite evidence of the severity of the disease, or of the probable outcome. They do not give any help in distinguishing between acute, subacute, and chronic cases, and during the disease they merely corroborate the clinical symptoms.

In the discussion which followed, Prof. R. MUIR expressed the opinion that the time was not far off when we should be able to establish a definite relationship between the functional disturbances and the structural changes in the kidney in the various types of nephritis. He referred to the progress already made in the differentiation of the azotæmic and hydræmic types, and was especially interested in Prof. Dunn's remarks regarding the association of the hydræmic type with subacute nephritis. He found it difficult to harmonise the modern physiology—e.g., the filtration re-absorption theory—with the pathological facts met with in the disease.

The following also took part in the discussion: Dr. J. NORMAN CRUICKSHANK, Dr. J. R. C. GREENLEES, Dr. G. M. WISHART, Mr. INGLIS POLLOCK, Mr. W. W. GALBRAITH, Dr. J. FERGUSON SMITH, Dr. H. E. JONES, and Dr. W. SYME.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting will be held at the Miller General Hospital, Greenwich, to-day, Friday, Jan. 11th, at 8.45 P.M. Mr. Willmott Evans, Dr. M. Davidson, Mr. C. A. Joll, Dr. Harold Pritchard, Mr. P. B. Roth, and others will show clinical cases.

SOCIETY OF MEDICAL OFFICERS OF HEALTH *Maternity and Child Welfare Group.*—A meeting of this Group will be held at the house of the Society, 1, Upper Montague-street, Russell-square, London, at 8 P.M., on Jan. 17th. Dr. William Cramer will read a paper on Vitamins and the Borderland between Health and Disease, illustrated by slides. The lecture is open to all those interested in Maternity and Child Welfare work, and members of the Dental and School Medical Groups are invited to attend.

MEDICAL SOCIETY OF LONDON.—The syllabus of the second half of the session 1923–24 has now been issued. The Lettsomian Lectures on the Treatment of Pulmonary Tuberculosis will be delivered at 9 P.M. on Feb. 18th, March 5th and 17th, by Dr. R. A. Young, and the annual oration will be delivered at 9 P.M., on May 5th, by Mr. Wilfred Trotter, on Certain Minor Injuries of the Brain. On Jan. 14th, at 8 P.M., a pathological meeting will be held. Dr. H. G. Butterfield will give a demonstration of his method and apparatus for micro-photography. On the 28th, at 8.30 P.M., Dr. G. Arbour Stephens will give a short historical note on Transfusion of Blood and Injection of Medicated Liquors as carried out in 1650–1700, and Dr. John Poynton, Mr. Twistington Higgins, and Dr. J. M. Brydone will communicate a paper on the Present Position of the Treatment of Pyloric Stenosis in Infancy. On Feb. 11th, at 8.30 P.M., a discussion on the General Symptoms and Remote Manifestations of Common Affections of the Nasopharynx, Accessory Sinuses, and Throat, will be introduced by Mr. Herbert Tilley, followed by Lord Dawson, Dr. John Poynton, Mr. W. M. Mollison, Dr. E. M. Callender, Sir Thomas Horder, Mr. C. W. M. Hope, Mr. E. D. D. Davis, and others. On Feb. 25th, at 8.30 P.M., a discussion on the Treatment of Fibroids of the Uterus will be introduced by Dr. Cuthbert Lockyer, followed by Sir George Blacker, Mr. T. G. Stevens, Dr. H. Williamson, Mr. Beckwith Whitehouse, Dr. N. S. Finzi, Mr. J. P. Hedley, Dr. Douglas Webster, and others. On March 10th, at 8.30 P.M., a discussion on the Disturbances of the Nervous System in Hyperpiesia will be introduced by Dr. Batty Shaw, followed by Sir Humphry Rolleston, Prof. Ernest Starling, Prof. W. Russell, Dr. James Collier, Dr. F. M. R. Walshe, Dr. Geoffrey Evans, and others.

Reviews and Notices of Books.

MASTER JOHANN DIETZ.

Translated by BERNARD MIALL. First published by Dr. Ernst Consentius. London: George Allen and Unwin, Ltd. 1923. Pp. 315. 12*s.* 6*d.*

Johann Dietz was a barber surgeon in the seventeenth century, who left behind him an autobiography in which he recorded his life from beginning to end, and this document, or its contemporary copy, is preserved in manuscript in the Royal Library of Berlin. The first version of the biography appeared some nine years ago under the editorship of Dr. Ernst Consentius, to whom permission was given not only for the printing of the manuscript, but for reproduction of any of the engravings necessary to supply the record with authentic pictures; this volume is a translation by Mr. Bernard Miall. It is a most interesting as well as profusely illustrated record of an adventurous career. From internal evidence presumably, Dr. Consentius states that the autobiography was not commenced until Master Dietz had reached his seventieth year, and the probability, therefore, is that the dating is not very strict, one episode reminding the writer of another, and that in turn requiring a sequel. Perhaps there is no maintenance of strict chronology, that may well be, but none the less we gather a remarkable picture of stirring times from one who lived, rejoiced, and suffered in them.

A member of the Guild of Barbers, Master Johann Dietz learned surgery in one of the normal methods of the times by serving on military campaigns—he went as doctor in the army of "the Great Elector" Friedrich Wilhelm, of Brandenburg. This distinguished prince, in support of the Hapsburgs and the Holy Roman Empire, or to annoy the King of France, took part in 1663 in a campaign against the Turks, and we have a fine description of the siege of Ofen, of military and medico-military proceedings throughout fierce warring, and of a weary journey back to Berlin. And in spite of the sensational nature of the episodes the story rings true, while it says much for the hero's thirst for adventure that almost immediately after arriving home we find him, in the most light-hearted way, accepting an offer made to him in a guest-house at Hamburg to voyage to the Arctic Ocean. Johann Dietz accepted an offer of 12 thalers monthly, to accompany three recent acquaintances for an unlimited time, and drew one month's pay in advance in order to buy a new medicine chest. And so he went a-whaling, in the course of which calling he describes Spitzbergen and Greenland, makes some amusing biological reflections, and details some dangerous voyaging back along the Norwegian coast with its fogs and hidden rocks.

The last part of the book is largely made up of the astonishing inconveniences and even unhappinesses of his career as a husband. He makes no secret of his view that he was caught, as to one of his alliances, by craft, a widow with three children securing him "after many fine opportunities and alternatives." He allows that he did his best to get out of the contract, which, however, was carried through although the bride's settlement seems actually never to have been paid.

But perhaps it was fair that Master Johann Dietz should pay in the unhappiness of married life for certain amatory episodes which he details with frankness in an amusing and informing narrative, every page of which reads like an imaginary journal by Defoe or Thomas Nash. The probable popularity of his adventures for public reading was, as a matter of fact, detected by one Christian Reuter, for it appears from one of the appendices to Mr. Miall's translation that the biography served as the text for that author's well-known German romance. This made its appearance in 1696, the author being almost contemporary with Johann Dietz.

HANDBOOK OF THE NEUROLOGY OF THE EAR.

Produced by Prof. Dr. G. ALEXANDER and Prof. Dr. O. MARBURG. Edited by Dr. H. BRUNNER, of Vienna, with the collaboration of eminent specialists. Vol. I., Part 1. Berlin and Vienna: Urban and Schwarzenberg. 1923. Pp. 699. Fr.48.75.

In recent years our knowledge of the reflexes and other nervous reactions originating in the ear, and especially in the labyrinth, has been rapidly increased by careful clinical investigations and by a long series of experiments on animals. The neurologist and the otologist have also been brought closely together in the study of the endocranial complications of ear disease and in the examination of the aural symptoms of certain cerebral tumours. The results of these observations are scattered through otological and neurological publications, and it is appropriate that a work should be published which deals with this borderland between neurology and otology as a whole. How extensive this borderland is may be judged from the fact that this large book is but the first half of the first volume designed to cover the subject. The first volume is to deal with the theoretical, the second volume with the clinical aspects of the subject. This volume is well printed and profusely and beautifully illustrated; it is without index or table of contents, and consists of a series of independent articles, each with its own contents-table and bibliography. They are very thorough and complete, and are written by well-known authorities in their respective subjects. Prof. Alexander describes the macroscopical anatomy of the nervous structures of the ear, Prof. Kolmer the microscopical, while Prof. Marburg deals with the development and anatomy of the nerves and central nerve-paths. Physiology is dealt with in a series of articles, including one on the outer and middle ear and one on the inner ear, and articles on localisation of sound, on perception of tone, and a full account by Prof. Magnus and Dr. de Kleijn of their experimental work on the otolith reflexes. Dr. Rudolf Leidler contributes a good discussion on vertigo, and Dr. J. Dusser de Barenne an interesting description of the physiology and neuropathology of the cerebellum.

All the contributions are of a high standard and when completed, the work will be of great value to neurologists and otologists alike.

SCIENTIFIC METHOD: AN INQUIRY INTO THE CHARACTER AND VALIDITY OF NATURAL LAWS.

By A. D. RITCHIE. London: Kegan Paul. 1923. Pp. 202. 10*s.* 6*d.*

Mr. Ritchie exhibits in this book an elaborate geniality, the affability of the schoolmaster who is a boy among boys, and is not too proud to use slang; but he has written a work that contains much information worth the ordinary reader's while to possess. He points out that inasmuch as no single mind can contain the whole of the results of modern scientific investigation, any man's opinion on most topics is bound to be superficial and based on hearsay. He therefore disclaims any attempt to survey the present state of scientific theories or to test their validity, but essays to state what kind of reasons there can be for holding any scientific theories, whether those of Pythagoras, Newton, or Einstein.

An introductory chapter dealing with the origins of science, its relation to metaphysics and to logic, a definition and a classification, leads to a discussion in Chapter II. of the ultimate data of knowledge and the classification of the data of experience. Chapter III. deals with natural laws, and Chapter IV. with the validity of laws, Chapter V. with measurement, and Chapter VI. with theories, while the concluding chapter is devoted to the limitations of scientific method and a consideration of science in relation to metaphysics. Mr. Ritchie's personal knowledge of experimental research gives point and interest to his illustrations. He is not, however, always scrupulously fair in setting out opinions with which

he disagrees. This appears in his discussion (on p. 132) of the justification of an average. The argument that an average of certain measurements is more likely to characterise the "true" value of the quantity sought to be measured is not, we think, disposed of by the remark: "The observer who imagines there is some real or true value, which can be attained by correctly calculating an average from a collection of different numerical results, is guilty of the absurdity of thinking that arithmetical calculations can supply better information about the external world than actual observation." He is guilty of no such absurdity; all he is guilty of is (*a*) a belief that several equally imperfect measurements are more likely to give a correct appreciation of the "truth" than one such measurement; (*b*) a theory that the value that gives a maximum probability to the concurrence of the measurements is the best approximation to the "truth" he can make. Neither proposition is absurd, the absurdity is really Mr. Ritchie's—viz., the tacit implication that "the observer" thinks that the quality of the observations to be averaged is indifferent. We do not believe that the most rabid exponent of the calculus of errors ever maintained any such proposition.

In discussing the genesis of discoveries, Mr. Ritchie is on firm ground. "The vital, if not the only, difference between the successful and unsuccessful investigator lies in the capacity to frame the appropriate generalisations that are presupposed in any research. Probably it is more a matter of instinct than of argument. The generalisation that is needed may be one that only has a very minute degree of probability a priori so far as any logical analysis can show. One may try to avoid the difficulty by saying that it is found by analogy, but that does not really mean anything. Analogy comes in undoubtedly, but in this process analogy is a very slippery guide. There will be a thousand false analogies for one correct one, and no obvious means of choosing them." A great investigator is as individual a genius as a great poet, but, in these days, when dull, rich men really think they can buy scientific discoveries, the point cannot be made too often.

MUSIC, HEALTH, AND CHARACTER.

By AGNES SAVILL, M.D. London: John Lane. 1923. Pp. 234 and index. 7*s*. 6*d*.

AN autobiography of Dr. Savill's musical conversion, to which is appended a discussion of the effects of music on the human organism, forms a most interesting book, one which might be called "From Darkness to Light," or "A Pilgrim's Progress." In the latter part of the book the interest lies in the view of music as a healing agent, taken by a woman physician who has slowly and after various trials been brought to religious faith after a period first of active dislike and later of scepticism. The ground here covered is not, therefore, new, save in its relation to the development of a musical sense. But the first part of the book should be widely read. Those who have and always have had the gift of properly appreciating music will take delight in the upward progress of the musical organism, from embryo to nearly full growth, and those who, to their regret, have no, or almost no, musical faculty, will be heartened in their quest by Dr. Savill's frank revelations of her progress. She tells us how when she was young, and for many years after, music not only bored her but awakened active dislike, not only of the music but also of the performer. In fact, she had much in common with the elder Mr. Osborn, who remarked, "I saw one of 'em speak to a damn fiddler, a feller I despise." Her first awakening came from seeing Maud Allan dance, though the pleasure here was not so much the sound of the music as the rhythmical illustration of it. Then she tried a mechanical piano, but, as was only natural at this stage, found but little pleasure in it, except that it could recall Miss Allan's movements. At last, in March, 1913, she heard Busoni play some Chopin and the light broke in upon her soul. Next she heard Pachmann, of whose playing she gives an admirable description, and before the summer of 1914 she had heard most of the leading pianists of the day, and she adds, "I recall with most delight the fine sensitive beauty of the interpretations given by Mr. Leonard Borwick." She does not tell us what this great artist played, but we hope it was Bach; if so, her musical education was advancing rapidly.

We do not follow Dr. Savill all through her pilgrimage—suffice it to say, that her awakening to orchestral music was brought about by hearing Parsifal. Thence she passed to Beethoven and Bach, to Tschaikovsky, and to some of the moderns, Vaughan Williams, Holst, and Delius. And her opinions and comments upon various composers and their works are of real interest. We do not—no one will—agree with all of them, but her progress so far has been so rapid that we see every reason for supposing that she will attain to the full standard of appreciation. For instance, Tschaikovsky's (6th) Pathetic Symphony has been dethroned from the high seat which it first occupied in her mind, and we venture to suggest that she should hear Nos. 4 and 5, both superior to No. 6. She knows but little of Bach, but realises that his is great music (pp. 100 et seq.) and yet she has apparently heard none of his organ music. To anyone who is able to say, as the author does on p. 208, "Great music arouses a condition of reverence, wonder, and joy, a state of mind similar to that which is produced by prayer, and hence it may be used to bring about the accomplishment of the same high and useful ends," there is a foretaste of the happiness to be gained in the hearing of the Chorale preludes, toccatas, and fugues. The great Toccata in F, with its solemn fugue, is a real musical translation of the twenty-ninth Psalm, and perhaps the most wonderful piece of abstract music ever written is the Dorian Fugue. There is another school of music to which we direct her attention—namely, the polyphonic school of Palestrina, his followers, and the Elizabethan madrigalists. If Dr. Savill learns to understand the Missa Papæ Marcelli (she can hear it at Westminster Cathedral), she will get over her musically youthful admiration of Parsifal.

Dr. Savill confesses that she finds difficulty in distinguishing the various sounds of the orchestra, especially of the wood wind, a difficulty which many others feel. This difficulty is a real bar to the right understanding of music and prevents the hearer from getting much of the good out of music. As a simple and singularly beautiful beginning we advise Dr. Savill to go to hear the B minor Symphony of Schubert, and to take with her a miniature score. In the slow movement is a conversation between flute, oboe, and clarinet, which will aid her to distinguish the respective quality of these instruments, for the score will tell her which is playing. We are in absolute agreement with Dr. Savill's main contention in the second part of her book, which, put shortly, is that good music brings us in touch with the Infinite. Hearing good music, given competent executants, is like talking to great men, for the music is the product of great minds. Of course, even the great composers had their weak moments. Handel wrote a good deal of rubbish, as well as such things as the slow movement at the end of "All we like Sheep," or the Amen Chorus which finishes the "Messiah," or the Allegro movement of the Organ Concerto in G minor in the first set of six, to take only a few of his masterpieces. Even Bach nodded sometimes, but, on the whole, anyone who can hear Bach, Handel, Schubert, Beethoven, Chopin, Palestrina, the Tudor musicians, and Purcell will feel that he is carrying out the apostolic precept, "Whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report; if there be any virtue, and if there be any praise, think on these things." That is the frame of mind which helps to maintain a sound body and therein lies the benefit of music in medicine.

Dr. Savill's book is a lighthouse which will, if they look at it, be a guide to many a one who is stretching out his hands in the darkness.

HEALTH AND CONDUCT.

By A. J. BROCK, M.D. Edin., with an Introduction by Prof. PATRICK GEDDES. London: Williams and Norgate. 1923. Pp. 296. 10*s.* 6*d.*

ON p. 285 Dr. Brock asks, "Is the main thesis of this book understood?" and the reviewer has to answer with modesty, "It is not." In such cases light is sometimes to be had from "forewords," but Prof. Geddes's introduction is as obscure as the rest. However, it is clear that Dr. Brock is not satisfied with our world as it is, is persuaded that it needs "sociological re-synthesis and re-orchestration," and that the process of cure is connected in some way with the methods of regional surveys. In medicine he feels that the orchestrator is the general practitioner, to whom specialists should be subordinated, and remarks that there is much less need of further detailed research than there is of our digesting the superabundant information that we already possess—an opinion which will find many supporters. But it is hard to trust an argument which includes the proposition (p. 30) that "the synthetic preparations of the State-supported German drug industry flooded our markets, and were obviously (for the ends of their manufacturers) within sight of controlling our philosophy of life." Perhaps Dr. Brock does not want to say more than that the most important thing in life is one's commonplace daily duty to one's neighbour—which may include giving him a dose of aspirin to help him over a headache; but if that is the message, its form has been insufficiently condensed. Many good qualities have gone to the making of the book, and the author's experience is considerable, but none the less seems to hit no particular mark.

LECTURE NOTES IN MEDICAL PROTOZOOLOGY.

By R. KNOWLES, Major, I.M.S., Protozoologist, Calcutta School of Tropical Medicine. Calcutta: D. N. Banerjee, Banerjee Press. 1923. Pp. 236. 7*s.*

IN these lecture notes, which are arranged as 20 lectures and occupy 236 pages, the author has given a condensed account of those protozoa which parasitise man and the methods by which they are studied. They are not a substitute for lectures, text-books, or practical laboratory instruction, but are intended to serve as a guide to the subject while the student is actually at work. The information is remarkably accurate and practically every important point has been noted. By the use of large type essential facts are emphasised, and warnings against common mistakes are brought to the student's notice. Certain books and papers which may be consulted with advantage are recommended. The student who uses this book as it is intended to be used will find it of the utmost assistance to him, and it will undoubtedly help to simplify a subject which often appears peculiarly confused and difficult to understand.

RUBBER AND GUTTA-PERCHA INJECTIONS.

By CHARLES CONRAD MILLER, M.D. Chicago: Oak Printing and Publishing Co. 1923. $1.75.

THE filling of all cavities in the human body is a difficult problem, and no material has yet been discovered which meets the requirements of every case. Dr. Miller suggests the use of gutta-percha and of rubber in finely divided form, and discusses in some detail the experiments he has tried in the production and manipulation of a suitable filling material. His work is extremely suggestive, but it is a pity that he has given no precise records of either the animal or clinical experiments which he has tried. His methods have scarcely emerged from the laboratory stage, and he concludes by the cautious statement that "for the present patients should be told that these methods are not as yet recognised as established surgical procedures."

The book may be recommended to those who wish to investigate the difficult and important question of filling defects, whether for curative or cosmetic purposes.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

II.—ASSESSMENT FOR INCOME-TAX: DEDUCTIONS, ALLOWANCES, AND RELIEFS.

BY W. R. FAIRBROTHER, F.S.S.,
ACCOUNTANT AND INCOME-TAX SPECIALIST.

For this relief much thanks.—*Hamlet*, Act I., Sc. I.

THE form of account-keeping having been explained in the first article,[1] it is now proposed to deal with the subjects of Income-tax assessment and the deductions, &c., which may be claimed for the purposes of tax.

Computation of Income-tax Assessment.

For the purposes of Income-tax assessment it is permissible to include salaries from public appointments in the assessment on the practice generally. This point was provided for in the preparation of the final account and proves of advantage inasmuch as one demand only is received instead of a number varying with the number of sources of professional income. It is presumed that the final account shows no private payments excepting in so far as it is impracticable to separate them from the business payments. These joint payments would consist of such items as rent, rates, repairs, insurance, lighting, and heating where the practice was conducted from the residence, which is, of course, the general mode of practice. In these circumstances the computation of the profit liable to assessment would be in the following form:—

Balance per account						£1,233	0 0
Add back to profits—							
Half rent (or Sch. "A")			£25	0	0		
Half repairs			5	10	0		
Half lighting and heating			10	0	0		
Half rates, &c.			17	10	0		
Half insurance			1	0	0		
						59	0 0
Adjusted profit for 1922–23						£1,292	0 0

If the practice has begun within the year of assessment (i.e., April 5th), the necessary proportion of the first year's profit will form the first year's assessment; the second year will be a 12 months' proportion of the first year; and the third year will be based on the average of the two preceding years. The fourth and subsequent years' assessments are arrived at on the well-known basis of the three years' average and the calculation of the assessment for 1923–24 would be as follows:—

1922–23—Profit as above	£1,292
1921–22—Adjusted profit previously agreed (say)	1,000
1920–21— ,, ,, ,, ,,	1,000
	3) 3,292
Average for 1923–24	£1,097

It should be mentioned that the proportion of private expenses added back to profit is not uniformly one-half, some districts regarding the proportion liable to be added back as two-thirds. The practice in and about the City of London appears to be to add back one-half, with the result that the other half of such expenses have in effect been allowed as a business charge. Why this practice is not adopted generally (particularly in the provinces) where practitioners conduct their practice from the residence is not easily understood, but it appears to be a point worthy of the attention of medical practitioners' associations. It is, of course, understood that where the premises are used for the practice only, and not for any private or domestic purpose, the whole of the expenses are chargeable.

With regard to the use of a motor-car in the practice a curious anomaly exists. The right to claim car wear

[1] THE LANCET, Jan. 5th, p. 30.

and tear is confined to traders and manufacturers, so that whilst a business man is allowed a deduction for depreciation of the car employed in his business a doctor, whose practice equally necessitates the use of a car, cannot claim the same deduction. The Royal Commission recommended that the allowance should not be restricted to traders, and in this case also there would seem to be scope for pressure by the professional associations to induce the Government to amend the law on the subject. A renewal of a car may, of course, be claimed, but only to the extent of the value replaced less the amount received on sale or exchange.

Deductions, Allowances, and Reliefs.

The amount of the assessment in respect of the business having been arrived at, it becomes necessary to make a complete return on the well-known buff form. The amount liable to assessment should be inserted on page 2, together with any other amounts arising under the other heads shown on that page. On page 3 of the form a complete return of all sources of income and of charges thereon should be furnished to enable the deductions and allowances to be claimed. Page 4 should also be carefully completed so that any allowances may be given against the assessment to be made. The notice of assessment issued later will follow the return made, provided, of course, the latter is correctly completed. On receipt of such notice the assessment amount should be carefully verified together with the appropriate deductions and allowances including earned income relief one-tenth, personal allowance of £135 single, £225 married, and wife to £45 if earning income, child allowance of £36 and each additional £27, housekeeper £45, widowed mother £45, dependent relative £25, first £225 of taxable income at 2*s.* 3*d.*, and life assurance premiums from 2*s.* 3*d.* to 4*s.* 6*d.* per £. The period within which to appeal against the assessment is 21 days, and any necessary notice should be given before that period expires.

There are certain circumstances in which adjustments may be made in the tax payable within or after the end of the year of assessment. The following constitute the principal grounds, and any adjustment can be made to take effect by way of repayment or of reduction in the outstanding tax :—

1. Where a change in ownership has occurred within the year, the current year's assessment is apportioned between the person ceasing and his successor.

2. Where owing to the person ceasing to carry on the profession or dying or becoming bankrupt or from any other specific cause (where ownership has changed) the profit falls short of the assessed amount, a reduction may be claimed to the actual profit of the year.

3. A person succeeding to the practice or a new partnership may apply for adjustment to the actual profit in the year of assessment if such profit is less through some specific cause arising since or by reason of the succession or partnership change. "Specific cause" as referred to here relates to such occurrences as removal to other premises, or loss of personal influence.

4. If the profession has commenced within the last four years a claim may be made for reduction to the actual profit of each year. It is not necessary, therefore, in this period to abide by the average figure and the option of claim is entirely with the taxpayer.

5. If the profession is discontinued, a claim may be made to have the assessment of the current year reduced to the actual profit and a further claim to have the total profit of the three previous years substituted for the total assessments of those years may be entered.

6. Where a loss is sustained in the profession, tax on the amount of such loss is recoverable against any tax paid for that year. This relief is usually claimed only in the absence of any other equivalent relief and then with discrimination, as the loss on which repayment is made is not allowed in reduction of future averages. It is, however, distinctly advantageous to claim when the rate of tax is falling as it can readily be seen that a repayment in, for example, a 5*s.* year, will result in a saving of 6*d.* per £ if the loss is set against a 4*s.* 6*d.* year.

7. In the event of it being found that an error or mistake in the return or statement has been made, repayment may be claimed for three years back on account thereof.

The foregoing points constitute salient features in the taxation of professions, but it will be appreciated that the many phases of assessment and allowances are subject to varying conditions and stipulations impossible of compression into a short article. The many Acts and various text-books on the subject of Income-tax readily demonstrate the complexity of modern taxation, and probably no field in the fabric of social life is so encumbered with legislative enactments and judicial decisions, not to mention the numerous modifications introduced in practice. The ramifications of taxation are so wide and so deep that even in an extensive practice it is an almost unique occurrence to deal with two cases containing precisely similar circumstances and conditions. It is true that members of any one profession may derive help in conforming generally to an approximately standard type of business assessment—as shown above—but it is equally true that in the computation of other income, in the statement of charges, and in the claiming of adjustments and allowances they must join the general community of confused and exasperated persons known as "taxpayers."

THE DISCOVERY OF RADIUM.

CELEBRATION IN PARIS OF THE TWENTY-FIFTH ANNIVERSARY.

IT is now just over 25 years ago that (on Dec. 26th, 1898) the discovery of radium was made known to the scientific world in a communication addressed to the Académie des Sciences de Paris. On Jan. 2nd two ceremonies took place, one at the Fondation Curie, the other at the Sorbonne, in celebration of this anniversary. The first of these was the inauguration, in the presence of Mr. Paul Strauss, Minister of Hygiene, of the Dispensary of the Fondation Curie; at this ceremony many leading scientific and medical men took part. Mr. P. Appell, Rector of the University of Paris and president of the Council of Administration of the Fondation, opened the proceedings; orations were then delivered by Mr. Régaud, professor at the Institut Pasteur and secretary-general of the Fondation, by Mr. Bergonié, and by Mr. Strauss, who expressed to all those associated with the Fondation, and particularly to Madame Curie, the recognition by the Government and the public of the great results obtained in the incessant work carried on by the institution.

At the second ceremony, in the great amphitheatre of the Sorbonne, the chair was taken by Mr. Alexandre Millerand, President of the French Republic, who had on his right Mme. Curie. Mr. Appell, speaking in the name of the Fondation Curie, described the achievements of science made possible by the great discovery associated with the names of Mr. and Mme. Curie, thanked the President and the representatives of Great Britain, the United States, Belgium, Spain, and other countries for their presence and support, and paid a tribute to Mr. Strauss for his organisation of regional centres for the campaign against cancer. He concluded his address by expressing the gratitude of the Fondation to Mme. Curie for her gift of a gramme of radium, to Mr. Henri de Rothschild for his recent donation of 500 milligrammes of the element, and to other benefactors of the institution.

Mr. Jean Perrin gave a brief survey of the importance of radio-activity, and Mr. Baclère dealt with the relations of radium and medicine. Mr. Léon Bérard, Minister of Public Instruction and Fine Arts, recalled the circumstances in which was passed the Act recording the discovery of radium, and expressing the gratitude and admiration of the Republic upon that occasion. Mme. Curie briefly replied, and the President associated her name with that of her husband in a final tribute of praise.

THE LANCET.

LONDON: SATURDAY, JANUARY 12, 1924.

ORGANISED MEDICAL RESEARCH.

THE report of the Medical Research Council for the year 1922–23, which is published to-day,[1] records the retirement from the Council of Sir WILLIAM LEISHMAN and Prof. F. GOWLAND HOPKINS, the two last remaining members of those originally selected in 1913. They have thus served the Council over a period of ten years, and this report is to some extent the record of a decade of organised medical research, for a number of the objects of present study were among the earliest schemes of work. Tuberculosis was one of these early objects, as was natural when the research fund was obtained from National Insurance resources by a levy of one penny per insured person.

The Council is no longer directly related to the Ministry of Health, but tuberculosis work continues to be directed by a group of subcommittees to which, by permission of the Ministry, Dr. A. S. MACNALTY acts as secretary. One subcommittee deals with bacteriological questions, another with the uses of tuberculin, while statistical studies are supervised by a Statistics Committee which includes other aspects of industrial health. A special subcommittee is in charge of the trials now being made with Prof. G. DREYER'S diaplyte vaccine. Heliotherapy comes within the scope of the Committee on the Biological Actions of Light. The personnel of all these committees is set out in the document, and we call attention to them as one example out of many of how the work of the Council has broadened and ramified during ten crowded years. The subject of accessory food factors, one of a group which sprang into importance in the critical years of war, continues to occupy the close attention of a committee appointed jointly by the Council and the Lister Institute. The work of Dr. HARRIETTE CHICK and her colleagues has modified the continental conception of rickets as an infectious disease and popularised the idea of vitamin deficiency which, nebulous though it still is, may prove a boon not only to the starving Viennese children who were the first to benefit. This war-time work has carried on into the post-war period which has provided many new activities of its own. Most dramatic of these was the overdue discovery of the function of the pancreatic islands by the Toronto school, since enriched by the work of Dr. H. W. DUDLEY and Dr. J. H. BURN at the Central Research Institute—work which is justifying Dr. H. H. DALE'S prophecy that insulin will prove to have an importance for physiology and medical science far beyond that of its use in the treatment of diabetes. These three examples, taken from different periods, will give an idea—it is impossible to do more—of the volume of organised research which increases from year to year.

A contribution of £130,000 is the sum-total allotted to medical research by a country of business men, and it is almost incredible how this sum has gone so far. It includes the expenses of the Industrial Fatigue Research Board, for which the Council became sponsor rather than allow its work to drop. The National Institute, the central forcing-house, absorbs about one-third of the remainder, and yet nearly 600 entries appear in the index of personal names of associate workers. Many of these are nursing seedlings which are still in cold frames, but there is more than a chance that some of them will prove hardy enough to survive, although no one can say which. One can only hope that the scientific zeal of the individual is not being unfairly exploited by the community, a suspicion raised rather than allayed by the Lord President of the Council when he stated recently that many men of science would work for Government at less remuneration than similar private work would receive. A closer study of the Research Council's finance is reassuring, for the Council is becoming increasingly a clearing-house for research funds. The Dental Board has allotted a large sum for inquiry into the causes of dental disorder, the Miners' Welfare Fund another for studies of miners' dietaries, the Carnegie Trust a third for investigation of environment on the growth of children. These and other grants from various sources, including relatives of grateful patients, are placed at the disposal of the Council. Moreover, the Rockefeller Foundation has made it possible to give a group of British workers the opportunity of scientific study in the United States besides sending American students here. The proper outlook of research is dealt with in a few striking paragraphs of the report. It is something other than that of the "man of science," so humorously ridiculed by Sir RONALD ROSS, as the sort of person who pulls out his watch and exclaims: "Ha! half an hour to spare before dinner: I will just step down to my laboratory and make a discovery." The bearing of much research work upon medicine and hygiene necessarily seems remote, but the history of insulin—even the name of which was suggested many years ago by Sir E. SHARPEY SCHAFER—is a complete justification of the wide view. And it is the wide view that must be popularised, for many can appreciate results who cannot follow the intensive studies which have led up to them.

[1] Committee of the Privy Council for Medical Research. H.M. Stationery Office. 3*s.* 6*d.*

FOOT-AND-MOUTH DISEASE.

HUMAN medicine is not greatly interested directly in the epizoötic stomatitis of animals, for it is a fact, as the Minister of Health recently stated, that foot-and-mouth disease is rarely communicated from animals to man, and, when so communicated, the illness has been mild; in this country there is no record of death having resulted in a healthy person. Moreover, the use of milk from infected animals is prohibited by law, and the enforcement of this regulation is not very difficult. But the epidemic of this cattle plague which is at present visiting the country presents problems very interesting indeed to the medical man; for here is an epidemic against which the most effective methods can be used, whatever they may be. Endemic small-pox or plague cannot be stamped out by simply destroying the centres of infection, but the Ministry of Agriculture has public opinion solidly behind it in attempting so to stamp out foot-and-mouth disease if the procedure can be justified economically. Up to the end of last week more than two millions of money had been laid out in compensation for destroyed animals, something over a quarter of a million being returned in the salvage of healthy carcasses. The total number of animals then condemned amounted roughly to 68,000 cattle, 25,000 sheep, 33,000 pigs, and a few goats. At the same time, hunting has practically stopped, and hunting is an industry as well as a sport, providing a weekly sum of £75,000 in wages and £175,000 a week in forage. Further, the risk of infection has led Australia to prohibit the

importation of cattle, sheep, swine, and goats from Great Britain or Ireland, the Union of South Africa has done the same, while the Free State of Ireland, after forbidding the import of animals and poultry from infected areas in Great Britain, issued a still stiffer order on the first day of 1924. Whichever way the nation turns there is fearful loss to contemplate, unless the policy of slaughter is rapidly successful.

On the epidemiological side the problem touches human medicine very closely, for is not the infection of epizoötic stomatitis of the same order as that of influenza or measles? It was proved during the last years of last century—by LÖFFLER and FROSCH, by HECKER, and by NOCARD and ROUX—that the virus will pass through fine filters. The virus is present in the blood-stream of affected animals in the early stages of the disease, and is found abundantly in the lymph of the characteristic vesicles and in the saliva. From these situations, however, it soon disappears. Recovery from the disease is the rule, but the immunity which is left is generally short-lived. In the average case, an animal which has passed through an attack is refractory to a second infection for about a year, but cases are not infrequent where a second infection follows within a period of a few weeks. The attempts which have been made to confer immunity have been partially successful. The possibility of passive immunisation of cattle with highly potent serum has been shown by NOCARD, ROUX, CARRÉE, and VALLÉE. An immune serum is obtained from cattle which have passed through an attack of the disease, or from cattle which have been hyper-immunised. Active immunisation is attained by injecting an animal first with immune blood and then with virus which is obtained from infective lymph or blood. The volume of blood required to confer passive immunity depends, of course, upon the potency of the blood injected. This, as a rule, is low, and the quantity required may be as much as 500 c.cm.—a fact which prohibits the application of the method in the field. Moreover, since it has been found by VALLÉE and CARRÉE that there exist more than one strain of virus, it is clear that a polyvalent serum would be required. Attempts to cultivate the virus have been made by many bacteriologists in France and in Germany, but so far without success. The isolation and easy cultivation of the virus is, however, clearly the first and most pressing need. Given a regular supply of virus, the immunity work would be simplified, and the possibility of prophylactic vaccination would be before us. Further, an accurate and precise knowledge of the virus would be of immense value to those who are engaged in attempting to discover the mode of spread of the disease—work of the first importance for this country. But here lies a grave difficulty which has apparently escaped the attention of the daily press in its almost petulant demand that something shall be done. It is simply impossible in the present circumstances for an individual bacteriologist or for any institute of research to undertake such work. The necessarily stringent regulations which aim at eliminating foot-and-mouth disease prevent this, and for the obvious reason that the authorities fear the possibility of the disease spreading from laboratories engaged in the research. Moreover, the expense of such work would be too heavy for the slender resources of any laboratory in this country. An attempt to cultivate the virus of foot-and-mouth disease would need official permission in the first place, and in the second place considerable public financial assistance. These granted, is the problem a fit one for investigation, and if so, what could reasonably be done?

The first of these questions deserves notice. The unprinted, though freely spoken, objections to the initiation of research are: First, that the problem of foot-and-mouth disease has been studied abroad during the last 20 years and without conspicuous success, and is therefore, if not insoluble, too difficult for profitable inquiry; and, secondly, that it is impossible to study the disease in this country because of the risk of spreading infection. The first objection may be dismissed: if this spirit prevailed in medicine there would be no research on cancer or, indeed, on any of the outstanding pathological problems. Medical knowledge would stagnate, and the profession would merit the contempt of enlightened men. The second objection has, if newspaper reports are correct, been answered by the veterinary experts of the Board of Agriculture. Pedigree herds of cattle which have been affected have been spared because the conditions under which the animals are kept, and the strict isolation of the farms on which the disease has occurred, are such that infection cannot spread. It can hardly be beyond the wit of man to plan an experimental farm at least as well situated and controlled as these.

In order to answer the second question—namely, what are the prospects of success in the search for the virus—we must be guided by what is already known of the class of organisms which are called "filter-passers." The human diseases which are known to be caused by filter-passing viruses have been extensively studied, particularly by the Rockefeller Institute in New York. The virus of infantile paralysis has been grown, and within the last three years OLITSKY and GATES have described a small organism, the *B. pneumosintes*, which they believe to be the cause of influenza. The difficulty with most of the human diseases lies in the proof that any given organism is the causal organism sought. We are compelled to resort to animal tests, and the lower animals are not as a rule susceptible to the disease under investigation. If the medical clinician has an advantage over his veterinary colleagues, the balance of advantage is more than redressed for the veterinary bacteriologist. In pleuro-pneumonia of cattle an exceedingly small coccus, just within the range of visibility of a good microscope, has been isolated in pure culture. The coccus grows readily on suitable solid media in minute colonies, and has been proved to be the causal organism by animal experiment. In this instance we have the one definitely successful culture of a filter-passing virus. Can the same success be achieved for foot-and-mouth disease? Maybe the coccus of pleuro-pneumonia is easier to grow than other filter-passers, but this cannot be affirmed until the attempt has been made. The technical procedure which is most in favour at the present time is that devised by THEOBALD SMITH and modified by NOGUCHI. The essential principle of the method is the employment of fresh tissue—usually kidney—a small piece of which is dropped into nutrient fluid. The medium thus produced is anaerobic and is suitable for the rapid cultivation of the ordinary large anaerobic bacteria. Coincident with the growth of an organism a haze develops, usually in the vicinity of the tissue, and this is transferred to another tube of the same medium in the ordinary process of subculture. Subsidiary lines of investigation consist in attempts to stain an organism or to examine the fluid medium under the dark-ground microscope. But the results obtained by such methods are generally unsatisfactory owing to the confusion produced by the occurrence of large numbers of particles which arise in the disintegration

of the tissue in the tube. The final and satisfactory proof that a living organism has been grown in such a liquid medium depends upon the successful production in series of definite colonies on solid media; and the proof that a pathogenic organism has been grown depends upon the successful reproduction of the disease under investigation in a susceptible animal by a remote subculture. The successes already gained in the study of filtrable viruses warrant us to be hopeful as to the outcome of an attempt to isolate the organism of foot-and-mouth disease. If there is any valid objection to such work being undertaken, it is on the ground of expense. It would be unwise to be driven into foolish or costly experiments; but when the present epidemic has died away, let us not fall into complacency.

ALCOHOLISM AND SOCIAL CLASSIFICATION.

WE publish elsewhere (p. 109) an abstract of a paper read last Tuesday before the Society for the Study of Inebriety by Dr. H. M. VERNON, in which he draws some valuable conclusions upon the factors concerned in the promotion and prevention of alcoholism, and in its incidence upon various classes of society, as displayed in the seventy-fifth annual report of the Registrar-General. This report relates to the period 1910–12, and the part played in the decline of consumption by high taxation or the reduced hours of sale is, therefore, not under consideration; but the information, and the deductions to which it gives rise, are none the less useful to all medical men, while the subject is treated by Dr. VERNON with the accuracy and suggestiveness that we should anticipate from one whose writings upon industrial efficiency and the related influence of fatigue have already given medicine so much to think about.

Dr. VERNON has simplified the classification of the Registrar-General by considering under one heading the five groups which can be described as "skilled and semi-skilled workmen," placing those engaged in the production and sale of alcohol in a separate category, while occupational groups, where the number of deaths from alcoholism and cirrhosis of the liver were very small, have been ignored, to the prejudice of certain more abstemious sections, but the effect of any error of judgment is annulled by the acknowledgment of the omission. The data relate to males between the ages of 25 and 65, and by comprising in one group all skilled and semi-skilled workmen the classes to be considered fall under five headings—namely: (1) this large combined group; (2) unskilled workmen; (3) professional classes; (4) shopkeepers; and (5) brewers and publicans. It is found that expressed as a percentage of a general mortality the alcohol mortality in all five is practically constant; for example, in the first group, with a comparative general mortality of under 600, there is an alcohol mortality of 7, while the next division had a comparative general mortality between 600 and 700, with an alcohol mortality of 10, and in succeeding divisions the alcohol mortality increased as the general mortality increased, save where the employees in the liquor trade manifested a worse rate. To show fully the significance of the correspondence between the two sets of figures it would be necessary to ascertain to what extent the general mortality is affected by alcoholic indulgence, and here certain evidence is obtained by comparing the cause of death in typical groups of individuals liable to indulgence with other groups not so liable, but otherwise of similar environment. Comparison has been made between the group whose members are engaged in the production and sale of liquor and the group classed as shopkeepers, which comprises drapers, grocers, butchers, greengrocers, ironmongers, chemists, and tobacconists. A tabular statement was given by Dr. VERNON recording the mortalities of the two groups from various diseases, when under each heading the mortality among the publicans was higher, whilst their mortality from alcoholism was vastly more sinister.

A distinct warning is given in Dr. VERNON'S paper that we must look elsewhere than to alcohol to account for the larger part of the variations in the general mortality of industrial workers. Those who work in the open air, as the Derbyshire coal-miner, those who work usually under cover, as the sawyer or the coach-builder, have their differences of environment, but in neither case are they subjected to the conditions which prevail in factory work with artificial heating; and among the coal-miners the mortality is low except from accidents, for although they are working underground and at high temperatures, there is circulation of air in the pits. Other groups of workers, as railway guards, bricklayers, ship-builders, give evidence of the importance of fresh air; and while the general mortality rises the moment we are dealing with typical indoor workers, such as cabinet-makers, boiler-makers, or printers, it is higher still among the group engaged in iron and steel manufacture, pulmonary conditions exacerbated by exposure after overheating playing their rôle. The section with the highest mortality includes those exposed to dust inhalation, and those who, like the Lancashire coal-miners and operatives in glass manufacture, work in excessive temperatures. And the general lesson is that the relationship between the alcohol mortality and the general mortality of industrial workers is constant, but different from that among those engaged in the liquor trade. A division with a low comparative general mortality comprises medical men, lawyers, and artists. Here the alcohol mortality is higher than among industrial workers. The far higher alcoholic content of spirits over beer explains the discrepancy, but not the tendency towards indulgence which is displayed in a section of the community possessing full knowledge of its dangers.

THE PANEL INQUIRY.

THE Court of Inquiry appointed by the Minister of Health to determine the capitation fee to be paid to insurance practitioners during the year 1924 held three public sessions on Friday, Jan. 4th, and Monday and Tuesday, Jan. 7th and 8th. On the first day the case for the doctors was set forth in evidence by Dr. H. B. Brackenbury in amplification of the printed document drawn up by the Insurance Acts Committee. Dr. Alfred Cox and Prof. A. L. Bowley giving corroborative figures. Dr. Gordon R. Ward made a statement on behalf of the Medical Practitioners' Union. The case for the Ministry of Health and the Scottish Board occupied the remainder of the Friday and all the Monday session. A report of the proceedings of these two days appears on p. 97. On Tuesday evidence was given on behalf of the National Association of Assurance Committees mainly by the President, Rev. W. D. Yoward, M.A., and the Hon. Secretary, Mr. Edwin Potts, and the Ministry of Health replied, the final word being with Dr. Brackenbury. The Court will sit again on Tuesday, Jan. 15th, to hear the case presented by certain independent approved societies, their main case being reserved for a session on Jan. 21st. We hope next week to report two further sessions. All that need be said at present is that the proceedings of the Court were of a harmonious nature and the impression was given to all parties of a fair and courteous hearing.

Annotations.

"Ne quid nimis."

PUBLIC HEALTH WORK AT THE LEAGUE OF NATIONS.

THE Council of the League of Nations at its session in Paris last month decided on the names of the six medical members of the new Health Committee of the League who were required to supplement those who had already been nominated by the Office International d'Hygiène Publique. The six members thus chosen were Dr. Th. Madsen (Denmark), who has been President of the provisional Health Committee of the League since 1921, Prof. Léon Bernard (France), Prof. Ottolengli (Italy), Dr. J. Jitta (Holland), Dr. Pittaluga (Spain), and Dr. Chagas (Brazil). The members already appointed by the Office International d'Hygiène Publique were its President, Mr. O. Velghe (Belgium), Dr. Raynaud (France), Sir G. Buchanan (Great Britain), Dr. Lutrario (Italy), Surgeon-General H. Cumming (United States), Dr. A. Granville Pasha (Egypt), Prof. Ricardo Jorge (Portugal), Dr. H. Carrière (Switzerland), and Dr. Mimbela (Peru), an additional nomination for a medical representative of Japan being left open. The constitution of the Health Committee of the League provides for only 16 members in the first instance, but the Council recommended the Committee to add to itself two other nominees, Prof. Nocht, of Hamburg, and Dr. Chodzko, late Minister of Health at Warsaw, who represented Germany and Poland respectively on the former organisation.

The membership of the new Committee, which is appointed for three years, is distinguished and influential. It may, however, be objected that its personnel is too exclusively derived from the official public health services of the countries concerned, consisting as it does so largely of Government delegates of those countries to the older international office. This circumstance, however, follows naturally from the fact that the activities of the League of Nations in health matters must in the main be carried on through the government public health services of the world which the older office represents. It may be recalled that under its new constitution the Health Committee of the League is expected to act when necessary through special committees on which experts on particular subjects have been co-opted, and it may be anticipated that this practice will be extensively followed. A more serious and obvious criticism is that on the basis of representation by countries no place is found in the present list for any member of the important public health services of India, of the several British Dominions, or of British colonies. Steps should be taken, with as little delay as possible, to rectify this omission from the constitution of a body which demands, and has hitherto received, welcome participation from all parts of the British Empire. The Health Committee will hold its first session under its new constitution at Geneva in the course of February, when reports of the League's commissions on quarantine measures in the Far East, on the unification of standards for therapeutic sera and of serological tests, on the opium traffic, on standardisation of "biological" remedies, and on international comparisons of cancer mortality will be taken. The Office International d'Hygiène Publique at Paris now acts officially as the advisory health council of the League, and at its regular sessions will in future have an account of the work of the Health Committee of the League before it for consideration, and the opportunity of making proposals for increasing the usefulness of the League's organisation for promoting international measures of public health.

A summary of the work of the last session of the permanent committee of the Paris office was included in the November number of the monthly bulletin of the Office International. In addition to the settlement of matters affecting its future as an advisory body to the League of Nations, while remaining otherwise autonomous, the delegates decided on the final text of the international nomenclature of causes of death, which had been left in doubt owing to the death of Mr. J. Bertillon. They established the existence of a wide difference of expert and administrative opinion on the American proposal that heroin should be prohibited for medical purposes, and settled the form of the proposals to be made to the Governments represented regarding international agreements relating to the composition of anti-diphtheritic serum and the adoption of a uniform pattern of Bill of Health for shipping purposes.

TUBERCLE IN THE FRENCH ARMY.

THE *Archives* of Military Medicine, which is the official journal of the French Army Medical Corps, devoted its last number (vol. lxxix., No. 1) wholly to the consideration of tuberculosis in the army, the chief paper being a long and careful discussion of the question from the practised pen of Médecin-principal M. J. L. R. A. Jeandidier, who with all his study is not very hopeful. He concludes that tuberculosis in the army only reflects the conditions of civil life, the morbidity being lessened, however, in the army by the selection which goes on when the recruits come up to join. What, then, is doing in civil life to get rid of this plague? We cannot destroy the infection; vaccinations have so far failed; now we are trusting that if we ward off massive infections, the small doses that will be received will set up a relative immunity. "Unable as yet to prevent tubercle," Colonel Jeandidier puts it, "we await protection by universal tuberculinisation." The army might be protected by the exclusion of all possibly unsound recruits, but that weapon is blunted from the start, for France, though she has only a small population, needs a large army. Hence the army cannot get rid of this scourge, but can only lessen it. This it can do in several ways: (1) In liaison with civil agencies; (2) by giving anti-tuberculous instruction to the soldier in barracks, not only to the sick in hospital; (3) by early diagnosis, and swift isolation and discharge of the infected; (4) by making selection as careful as possible at entry; (5) by constant, assiduous observation of the doubtful whom the army has to receive; (6) by strict application of hygienic measures; methodised training; sufficient, varied, and well-cooked food, healthy housing, sufficient warming, enough clothing, good medical treatment. But having enumerated all these points Colonel Jeandidier comes back again to the basic fact that since a definite number of recruits are required every year, they cannot be obtained if all the suspicious are excluded; so far the balance has been found from colonial troops, themselves very susceptible to tubercle. The alternative—namely, long service for sound men—is too expensive. Every hygienic measure means more expense, for the new watchword "Selection and hygiene" is just the familiar "Men and money." Can they be found? Or must it be admitted that the watch-dog costs so much that the house must be left open to the thieves? Colonel Jeandidier leaves it at that.

CHRONIC ULCERATIVE COLITIS IN CHILDREN.

IN a paper read before the last annual meeting of the American Pediatric Society, Dr. Henry F. Helmholz,[1] of the Mayo Clinic, has recorded five cases of chronic ulcerative colitis in children aged from 8 to 15 years. Four of the cases had been under his own observation, and one had already been published by Logan, who in 1919 had defined the condition as a chronic inflammation of the large bowel of unknown ætiology, and showing all grades of inflammation from a reddened, congested, easily bleeding

[1] American Journal of Diseases of Children, November, 1923.

mucous membrane to superficial and deep ulceration with constant or recurring dysentery lasting from many months to several years. In none of Dr. Helmholz's cases was it possible to demonstrate the presence of any pyogenic, dysenteric, amœbic, or tuberculous infection. In four cases the colitis started acutely with a bloody diarrhœa, and in only one instance was the condition chronic and not accompanied by diarrhœa. The ulceration begins in the lower part of the bowel, and in the course of the illness the entire colon is involved. The ileum is rarely affected. On proctoscopic examination the ulcers are usually most marked in the rectum and lower part of the sigmoid. The colon as a rule is thickened. In severe cases only small islands of normal tissue are left, the entire surface being ulcerated and presenting a granular appearance. X rays show marked narrowing and absence of haustrations of the colon. The stools are usually five to ten in number daily, and contain a considerable amount of muco-pus and blood, frequently in clots. If there are no complications the temperature is usually not raised. Acute arthritis, which is frequent in adults, was seen in only one of the present series. The diagnosis is based on the occurrence of muco-purulent diarrhœa, with the passage of considerable amounts of blood, usually in clots, the persistence of the dysentery in spite of all medical treatment, and the absence of any of the usual ætiological factors. The prognosis under medical treatment is bad, as was illustrated in the present series of cases which did not show any improvement until after surgical intervention. The operation of choice is Brown's method, which consists of an ileostomy, with the establishment of a complete fæcal fistula through which the colon can be irrigated.

FOCAL SEPSIS.

NOT the least useful of the functions performed by a medical congress is that of concentrating general attention on the more outstanding problems of the moment. This was reflected at the recent Australasian Medical Congress of the British Medical Association in Melbourne, the first of its kind ever held in Australasia, which covered six days, and was concluded on Saturday, Nov. 17th. One of the most interesting discussions was that on Friday afternoon, dealing with focal infection in relation to general disease. Dr. R. Scot Skirving, of Sydney, who opened the discussion, urged that all definite septic foci should be treated by radical removal, whether they were thought to be responsible for general disease or not, a conclusion with which it is difficult to quarrel; but the scanty nature of the evidence linking such foci as dental abscesses even with diseases such as rheumatoid arthritis and pernicious anæmia was rightly emphasised by several subsequent speakers, including Prof. A. E. Mills, of Sydney, and Dr. S. O. Cowen, of Melbourne. In our last issue we reported a discussion on pneumococcal infections which took place at the meeting of the Manchester Pathological Society on Dec. 12th, Dr. J. H. Dible's opening paper appearing in full in the same number. The opinion of the pathologists, including Profs. Shaw Dunn and Matthew Stewart, appears to be trending strongly towards the view that such infections are more often due to local spread than has hitherto been believed. Dr. Dible in his concluding remarks crystallised such belief by saying that he felt that the hæmatogenous theory of invasion had been overthrown in two of the chief pneumonic infections, and that bacteriologists as a whole realised that the blood in most bacterial infections was well able to look after itself.

The whole theory of the responsibility of oral, pharyngeal, and intestinal sepsis for general arthritis, anæmia, gastric and duodenal ulceration, dermatitis, and a host of other diseases, still rests upon the flimsiest of bases. The experimental studies[1] of E. C. Rosenow, which at first appeared to throw a flood of light on many pathological problems of magnitude, have, as far as we are aware, never been adequately confirmed. Lord Dawson, speaking from the chair of the Medical Society of London, referred some 12 months ago to the importance of this omission. Rosenow's work seemed to show that streptococci, cultivated from the septic teeth of a patient with gastric ulcer, would, on injection, often produce such ulcers in rabbits. This, and many similar observations by the same worker, seemed to supply the long-sought evidence. Published in 1919, the experiments are not yet accepted by the majority of pathologists. At the same time there is no ground for entire scepticism on the subject. The Wassermann reaction gives us evidence of a general infection from a small primary syphilitic sore, which it would be impossible to obtain otherwise. Yet Prof. Fourneau, of the Pasteur Institute, has been able to synthesise a drug which, taken orally, will prevent syphilitic infection in human beings or monkeys when the spironema is inoculated into a skin lesion. This is the latest result of a belief in the relation of general to local infection which is clearly sound though not based upon microscopic bacteriological evidence.

The consolidation of the dental profession presents a fitting occasion for a more thorough investigation of the problem of focal microbic infections, and we suggest that, in view of the importance of the subject, the Ministry of Health would be well advised to organise a complete inquiry into the matter.

[1] Journ. of Dental Research, 1919, i., 205.

"THE KIND OF NURSE SHE WANTS."

A LETTER with this heading was published in our issue of Dec. 1st, 1923, from a writer who complained that the employment of trained nurses was very embarrassing to small householders, and indicated that there were many illnesses where the patient only needed "someone to wash me, to bring me my food, to make my bed, and in fact to attend to my physical needs" for which services a trained nurse was not required. The writer gave expression to a really great public need, but made no suggestion how it should be met, and we confess that our own position is somewhat similar. Once again we have an example of social progress where in the course of the progress certain of the old amenities are lost.

For the last 40 or 50 years the whole course of opinion, we may say of civilisation, has tended to develop a nurse highly educated in theory and highly trained in practice. Such a nurse can be trusted not only to take the patient's temperature and pulse, to keep an accurate note of excretions, and to make simple analyses, but also to record with intelligent comprehension much clinical observation. Further, the modern nurse is familiar with the details of aseptic surgery, and thoroughly capable to assist a surgeon in a difficult operation This highly finished product is valuable, is properly aware of the fact, and has developed a sense of professional self-respect. For the cases that need her she is exactly what is needed. But for the writer of the letter in our columns she is not "the kind of nurse she wants." And where serious sickness is not in question the position and capacities of the modern-trained nurse may prove an embarrassment, especially if she be without tact. She is herself well educated in her own subject, but often ignorant of the world from other points of view, owing to the semi-conventual life of a hospital, although we believe this is less so than a few years ago. She may find herself unwelcome in a house, and be aware that her emolument is adding to the cost of an already expensive illness. Her ways are not the ways of her employers, any more than her people are their people. And employers are often selfish and tactless, when the illness is not one where every detail in the life of the household has to be subordinated to the claims of the sick and the sick-nurse.

It is not, therefore, a matter of wonder if those who are invalids rather than acutely ill, should desire

some simpler and less expensive attendance than is given by a trained nurse, while it seems clear that it is not from a trained nurse they should expect it. Those who are in the situation of our correspondent really want a domestic servant with some knowledge of nursing routine such as might be picked up by a brief sojourn at a cottage hospital. In three months a lady's maid, an intelligent parlour-maid, or a housemaid might be given enough training to make her a valuable adjuvant to the patient and the doctor in cases of invalidism. Fifty years ago such patients were always nursed in this manner; they were saved both from strange hands and strange ways, and from the heavy expense attendant thereon. Is it possible that a system should arise whereby a class of nursing-maid could be created? Or must any attempt to organise such a grade of nurses mean underselling the existing highly qualified service, with some risk of putting a premium on ignorance? In America the Rockefeller Foundation definitely advises the creation of a nurse of this simpler kind. It proposes that she shall have about nine months of training and be registered in her own class. Anything like a second register in this country would be opposed on general lines as retrograde, and a letter from Miss Muriel Payne, in our issue of Dec. 29th, shows that this apprehension has grounds. Nevertheless the suggestion has been made of making a register of handywomen who are not qualified midwives, and this dual scheme of maternity helps has the support of the Ministry of Health. But apart from a definite register of nursing-maids, use might be made of certificates from the cottage hospitals. The district nurse is not in question. She is a fully trained nurse who has specialised in house-to-house work after certification. She would be one of the very best agents for sanitary education in the kingdom if the county authorities had their eyes open, and if the public had learned to appreciate her rôle, and it is certain that in course of time she will come into her own. But she is not fitted for the work now under consideration. If any organised body could produce the requisite article it would probably be one of the Cottage Nurses' Associations. They might, if there was a demand, supply the kind of nurse required, or even, as in other industries, create the demand by offering the supply. That there is considerable need of some such nursing we have no doubt at all, but at present neither the demand nor the supply is organised.

INSECT PESTS.

MAN is so sure that he is the only live thing which matters very much that he is always quite ready to urge that if bacteria are not the most important group insects certainly are. And the recent progress of knowledge has emphasised the parts played by them in all sorts of directions centring round human activities and interests; the species of insects are so numerous that it is little wonder that they do a great variety of different things and turn up in one form or another almost everywhere. Mr. R. A. Wardle and Mr. P. Buckle have put together a most interesting survey[1] of the methods which are available for keeping insects within reasonable bounds. For the most part the authors deal with insects in relation to vegetable crops, and it is interesting to notice how the cultivation of great quantities of the same plant in an area has brought pests into prominence. This is due, no doubt, partly to the demand for a higher standard of healthiness by the cultivator, and finds its parallel in the refinement in human beings which has come to call the common cold a "disease." But it may be attributed mostly to the effect of aggregating large populations together and giving the parasites a larger field to work over in their business of breeding out virulent races. It is when the give and take of natural conditions is artificially broken up that parasites get their real chances; market gardening on the modern scale has much the same effects as compulsory elementary education and urbanisation in general. And the problem in this particular branch of economic entomology is just the same as confronted the early human sanitarians, such as Chadwick, whose portrait Mr. Lewis has been exhibiting so effectively in Oxford-street. Along lines such as these the whole problem of the control of plant pests is of great interest to anyone concerned with human hygiene; the parallels and differences might profitably be discussed by both groups of workers, for each will get help from the other. The items of immediate medical interest are not treated at all fully; mosquitoes receive some attention, but fleas and bugs are mentioned only casually and *Glossina* apparently not at all; lice and ticks are dealt with in more detail. Domestically, several methods are noted for cockroaches, but the only reference to furniture beetles is a mention of the thermal death point. The book does not, indeed, purport to be an exhaustive encyclopædia of what has become a vast subject; and it is better that it should not be so. Though it is not very well written and the paragraphing is bad, in its present form it will afford interesting and suggestive reading to many people who are not immediately concerned with agriculture at all, and the ample bibliography at the end suggests how easy it would be to follow up any particular point.

[1] The Principles of Insect Control. By R. A. Wardle, M.Sc., Lecturer in Economic Zoology in the University of Manchester, and P. Buckle, M.Sc., Lecturer in Agricultural Zoology in the University of Durham. Manchester: University Press. 1923. Pp. 295. 20*s*.

TWO ROCKEFELLER GRANTS TO CLINICAL MEDICINE.

AT the end of last year announcement was made of two substantial donations by the Rockefeller Foundation towards clinical teaching in Great Britain. Some details of the Edinburgh grant were given by our Scottish correspondent in our issue of Dec. 29th. It had been recognised for some time that the facilities for clinical research and for advanced teaching in both medicine and surgery were not adequate for a school with the reputation of Edinburgh, and it was in order to meet this need in some degree that the grant was made. Of the total sum of £50,000, £33,000 are to go towards the building and £2000 towards the equipment of a medical clinical laboratory. In order that the director of the laboratory may be free to devote himself to this development, a further grant of £1000 per annum has been made for five years to supplement his salary and that of his staff, and to enable him to make necessary additions to his staff. As regards surgery, it is planned to unite the two existing chairs of systematic surgery and of clinical surgery under one whole-time professor, and, subject to the completion of these plans, a sum of £15,000 will be applied to augment the endowment, so that the salary of the professor may be approximately £2000. The remaining sum of £750 for five years will be available for additional salaries rendered necessary under the scheme.

In making a donation of £14,000 to the Welsh National School of Medicine the Rockefeller Trustees warmly approved the ideal of a National College of Medicine for the whole of Wales, and the adoption of the unit system of teaching in the final years of medical study. Two other factors which, we understand, influenced the Trustees in their decision were the public-spirited response of local authorities in Wales to the recent appeal on behalf of the medical school—the product of one-eighth of a penny rate was conceded—and the fact that the Cardiff Royal Infirmary has now allocated the minimum number of beds needed for a medical unit. The gift is regarded as a landmark in the history of the medical school and is worth far more than its mere monetary value. The prestige attached to recognition by the Rockefeller Foundation will be of particular benefit to a school which has taken such a definite line of its own in medical education.

CARCINOMA OF LINGUAL THYROID.

ACCORDING to Dr. Albert F. Tyler,[1] of the Department of Roentgenology, John A. Creighton Medical College, Omaha, who reports an illustrative case, the term "lingual thyroid" is applied to a tumour in the root of the tongue due to failure of the thyroid to migrate to its normal position during embryonic development. The condition was first described in 1853 by Vernueil, who discovered it in dissection of the insertion of the muscles of the tongue to the hyoid bone. The first case reported in American literature was that by Bernays in 1888. In 1922 Hartley collected 44 cases, including one of his own. The condition is found at all ages. In Hickman's case the tumour was of sufficient size to produce suffocation in a new-born child, while Staelin's patient was a woman, aged 77. Although present from the first month of intra-uterine life lingual thyroids seldom produce symptoms before the period of sexual activity, so that they are usually recognised between the ages of 15 and 40. Of the 45 cases now on record, 41 were in females and only four in males. The tumour is usually situated above the hyoid bone in the posterior portion of the tongue at the site of the V-shaped groove. It most frequently occupies a lateral position, though occasionally, as in Bernays's case, it is located centrally surrounding the foramen cæcum. It is usually ovoid in shape, and varies in size from 0·5 to 5 cm. in diameter. The mass usually produces a prominence on the dorsum of the tongue, and when it has reached a certain size projects downwards beneath the mandible and above the hyoid bone. The principal symptom is a feeling of pressure in the throat, causing dysphagia or dyspnœa. A desire to "clear the throat" is usually present for several years before the cause is recognised. Occasionally profuse hæmorrhage occurs from rupture of one or more of the enlarged vessels in the growth. Lingual thyroid must be differentiated from other tumours which occur at the base of the tongue, such as sarcoma, lipoma, angioma, gumma, and lingual tonsil and cyst. Medical treatment in the form of administration of sodium iodide or other drugs has little or no effect. The use of the galvano-cautery should be avoided owing to its inability to remove all the thyroid tissue. Surgical enucleation by the intra- or extra-oral route is the best treatment. The use of X rays is beneficial in cases where removal is impossible or malignant degeneration has taken place. Dr. Tyler's case, which occurred in a man aged 54, was remarkable for the fact that the tumour which had first been noticed eight years previously had undergone malignant degeneration and was complicated by metastases in the lungs. Complete removal was impossible, but X rays and radium caused considerable relief, although the case ended fatally.

THE MODERN CAVE-DWELLER.

THE Henry Saxon Snell Prize, founded by the Royal Sanitary Institute to encourage improvements in the construction or adaptation of sanitary appliances, is to be awarded this year for the best essay on Improvements in the Sanitary Conditions of Underground Dwellings and Small Underground Workshops. The present situation is thus summarised in the circular[2] announcing the conditions of the award.

Throughout London and most large cities, houses of all grades are generally built with basement stories, partly if not wholly below the level of the adjoining street. These basements are used for living quarters and often for offices or workshops. This has been due mainly to the great cost of land, and in a lesser degree to the difficulty of obtaining satisfactory foundations at a comparatively high level. In the old type of house, too, the basement story made it possible to isolate the service and working departments. Economy of ground space was, however, and still is, the ruling factor.

Obviously, without special precautions, these basements cannot compare with the upper floors in the matter of light, cleanliness, and ventilation. A typical London basement is lighted and ventilated from areas at the back and front. These areas vary in width and space according to the grade of the house. Generally there are, beyond the narrow areas in front, vaulted cellars, which may be, and generally are, used for storing coal and coke. Outside in the area are one or more dustbins (from which much dust must escape whenever they are opened for new accretions), and a manhole and fresh-air inlet. The coal, too, may be more or less wet, and the coke will give off sulphurous fumes. The cellars themselves are probably reeking with damp owing to the want of damp-proofing.

Dust from the road will, of course, find its way into all the lower floors of a house, but the basements get the heavier particles, which may be largely composed of horse-droppings, &c. Only too often the area in the rear is in time covered over, and through ventilation ceases. Basement floors are often "solid"—i.e., laid direct on to the ground concrete, and are comparatively colder than the upper floors, even if they are not actually damp.

These are the conditions which have to be faced at the present time. To forbid the use of basements as habitations or workshops might be desirable, but it is not practicable. The Sanitary Institute has been well advised is asking for the coöperation of practical sanitarians in obtaining suggestions as to arrangements that can be made and appliances that can be used for overcoming admitted defects in a really practical way, not prohibitive in cost. It is no use to tell a cave-dweller that he ought to dwell elsewhere when no other dwelling is available for him or his family.

TREATMENT OF LETHARGIC ENCEPHALITIS.

Dr. Hans Hoff [1] gives the following account of the various methods of treatment for lethargic encephalitis employed in the Vienna University Clinic for Psychiatry and Neurology from Jan. 1st, 1916, to May 30th, 1923. Intravenous administration of urotropin as recommended by Economo was employed in 28 cases. The doses consisted of 10 c.cm. of a 10 per cent. solution and ten or more injections were given. The therapeutic effect was almost negative, or at least slight. Economo also made use of iodine in the form of a 50 per cent. solution of sodium iodide or of Pregl's solution,[2] given in doses of 10–150 c.cm. until a total of 1000–1500 c.cm. had been injected. The doses of sodium iodide solution ranged from 4–20 c.cm., a total of 300–400 c.cm. being injected. This method was followed by some improvement, especially in the myoclonic forms, but could not prevent the disease becoming chronic. In forms with meningeal symptoms injection of staphylococci and meningococci caused considerable improvement of these symptoms. Much benefit was also derived in acute cases from a combination of sodium iodide or Pregl's solution with Besredka's typhoid vaccine intravenously, but in chronic cases the results were disappointing. When typhoid vaccine was used by itself considerable improvement took place in the lethargic forms of the disease. In a number of acute cases, vaccineurin—i.e., a combination of the autolysats of *B. prodigiosus* and staphylococcus—was employed with very satisfactory results and appeared to prevent recurrences, but in chronic cases had no effect. In about 25 per cent. of the patients suffering from the chronic sequelæ of encephalitis, including a number of cases of Parkinsonism, inoculation of malaria was of some value, but the improvement was not very considerable. Intravenous injection of sodium cacodylate as recommended by French observers in doses of 0·5 to 2 c.cm. of a 50 per cent. solution appeared to produce some improvement in Parkinsonism and the other sequelæ of encephalitis, but not to any great extent. Dr. Hoff

[1] Journal of Radiology, November, 1923.

[2] The prize is of the value of 50 guineas and carries a medal. The address of the Royal Sanitary Institute is 90, Buckingham Palace-road, London, S.W. 1.

[1] Wiener klinische Wochenschrift, Dec. 20th, 1923.

[2] Pregl's solution: a watery solution containing about 0·04 per cent. free iodine, together with sodium, iodine, hypoiodite, and iodate in ionised form, as defined in the excellent German medical dictionary of Guttman (Medizinische Terminologie. Berlin: Urban and Schwarzenberg. 1923).

concludes that acute encephalitis is amenable to treatment, but that the sequelæ of encephalitis, especially Parkinsonism, have hitherto proved refractory to any form of treatment in most cases.

SEASONABLE ADVICE ON BRONCHITIS.

"IN this cold, damp climate many aged persons contract a fatal bronchitis in bed." These words, from the address on bronchitis delivered by Sir James Barr before the Huddersfield Medical Society on Wednesday last, epitomise the experience of the majority of medical practitioners. The importance of this malady is shown by its position amongst the fatal diseases recorded in the Registrar-General's report, where it ranks above pneumonia, and only just below tuberculosis and cancer. A lecture on such a subject from an authority with years of clinical experience behind him is accordingly of practical interest to us all during the full rigour of the winter. For Sir James Barr emphasises the fact that though the ultimate scientific explanation of the relation of climate to the disease may have changed, yet the importance of atmospheric factors remains as great as ever. The following passage is in his own words:—

"A chill due to exposure is undoubtedly an ætiological factor in the causation of bronchitis, but you must clearly understand what you mean by a chill; a cold, dry, still atmosphere much below the freezing-point cures the bronchial catarrh often associated with tuberculous disease of the lungs. It is a cold wind with a moist atmosphere which chills you to the bone, and finds out the weak spots in your economy. When a person is feverish or well supplied with internal fuel he can stand much external cold. There are on record cases of typhus fever who in their delirium escaped, and after living for some days in the snow without food or clothing recovered. It is quite another matter when the internal temperature is subnormal, and the vital powers depressed from any cause. When the vital resistance is lowered, and especially during sleep when the controlling influence of the nervous system is partially suspended, the individual is much more liable to the catarrhal effects of cold, hence bronchitis is much more frequent and fatal in the very young and very old than in adults."

Sir James Barr is confident that immediate treatment can abort or cut short many cases if dealt with promptly. He says: "When a person after a severe chill has some distress in breathing he should have a warm mustard bath, be put to bed in a warm room, and, if he still feel chilly, have a glass of hot punch. A conscientious teetotaller can have a bowl of hot gruel, but as a rule, teetotallers do not object to punch so long as it is prescribed as a medicine—the only danger is that they may be getting a chill too often. After this he should have no food for 24 hours, but may have plenty of hot water. He can have a Dover's powder, or Sir Archdall Reid's universal panacea of Dover's powder with aspirin and phenacetin. The following morning he should have a saline purge and then remain in bed for two or three days on a starvation diet. By the end of that time he will probably tell you that he is all right, and does not know why you have made such a fuss over a chill. However, when he hears of some of his neighbours dying under similar conditions he will feel more grateful." In a later passage attention is drawn to the importance of the vital as opposed to the merely microbic factor in many of these cases. Speaking of acute suffocative œdema of the lungs, Sir James Barr says: "The pneumococci play a very small part in these cases . . . . the pneumococcus is not such a virulent organism as to kill in a couple of days, even pneumonic plague would scarcely act so rapidly." He assures the practitioner that continuous vigilance on his part is the one road to safety. "By sticking to your patient until you see him past the danger signals you can do far more good than any consultant who comes in, prescribes, gives his opinion and prognosis which may or may not turn out correct, and," adds the speaker drily, "disappears with his fee."

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LIII.—THE ACUTE MENTAL CASE: ACUTE CONFUSION OR DELIRIUM.[1]

FOR the purpose of this article acute mental cases may be classed in three general groups—viz., acute confusion or delirium, acute depression, and acute excitement. Each of the types may have a rapid or even a sudden onset, and the difficulties of treatment are increased from the outset by the practitioner's frequent and very natural lack of certainty as to diagnosis, prognosis, and duration.

The immediate problem in every case is the decision whether the patient is to be treated at home or removed to a mental hospital. In arriving at this decision, which is often a very important and difficult one, the following considerations must be carefully weighed.

Acute Confusion or Delirium.—The patient's life is, or may at any moment be, in grave danger, and without constant skilled nursing, as well as careful medical treatment, he will very probably die. On the other hand, the duration of the acute illness will probably only be a matter of a few weeks, or often less; the prognosis is excellent if the patient's strength can be maintained; there is nothing in the treatment which the practitioner need hesitate to undertake, given skilled nursing assistance, and there are very understandable objections to applying the present legal machinery of "certification" to a case of acute recoverable illness, which is at least as much bodily as mental.

Acute Depression.—The duration cannot be forecasted, though recovery is a practical certainty. Continual observation and attention will be necessary, various alterations may be required in the accommodation and furnishing of the house, and the patient and his relatives are apt to have a bad effect on each other.

Acute Excitement.—As in depression, the duration is uncertain and the prognosis very good. The patient will need not only observation, but skilled guidance and care, and even with this his state will in all probability cause considerable alarm and distress to those in the house or to near neighbours from time to time.

From this summary it will be seen that the question is largely a financial one. In a reasonably suitable house there is no reason why the treatment of the most acute case should not be undertaken at home, granted the possibility of obtaining ample nursing assistance. Financial and other considerations, however, often combine to make it more convenient to send the patient to a mental hospital. It is always wise to call in, whenever possible, a colleague with special knowledge of psychiatry to share the responsibility of the decision. It will be understood that there are many other types of mental case of more gradual origin and chronic course which may obviously be treated at home without difficulty, or in which there may be other alternatives to home treatment than that of admission to a mental hospital. We are limiting our discussion, however, to acute cases, and what follows is on the assumption that the patient is being treated at home. Only specially important points are referred to, a comprehensive discussion of treatment being impossible in the allotted space.

Acute Confusion or Delirium.

The cases in this group have been variously named and classified as "acute confusion," "acute delirious mania," "the infective exhaustive psychosis," &c.

[1] An article on the home treatment of Acute Depression and Acute Excitement will appear in the next issue of THE LANCET.

The two elements of infection and exhaustion are invariably present, and the more obvious and specific the toxic element is, the more rapidly effective is treatment likely to be. Most acute alcoholic cases are to be included in this class, as also are the cases following childbirth—"puerperal insanity." A typical case recently under care occurred in a naturally nervous and poorly-nourished youth after a minor surgical operation which had gone septic. In considering treatment it is to be remembered that all these cases are essentially similar to those of delirium occurring in, say, enteric fever, or sometimes even in pneumonia. A short prodromal period of semi-stuporose confusion, with vacant appearance, disconnected answers to questions, and fitful attention is common. A patient in such a state may pass into acute delirium at any moment. If not already in bed he must be put there at once, and the services of two thoroughly competent nurses secured without delay. The characteristic signs rapidly make their appearance: great restlessness, rapid pulse and respiration, furred tongue, sordes on lips, large and sluggish pupils, incontinence of urine and fæces, and vivid hallucinations of hearing or sight, with muttering rambling incoherent talk or shouting. Great rise of temperature is not a feature, but a four-hourly chart will rarely, if ever, fail to record some degree of fever. The routine measures are obvious. Quietness, coolness, the absence of glaring light, and abundance of fresh air are essential. Though incontinence is the rule, there is often difficulty in getting the bowels to act in the early stages, and occasionally retention of urine occurs. Finally, careful physical examination must never be omitted. Acute conditions of the appendix, kidney, ovary, and other organs are often overlooked in delirious cases by physicians who have been blinded to the physical possibilities by the prominence of the mental symptoms. Any specific source of toxæmia or local source of infection will be sought for and treated with all energy. In a puerperal case, for example, any abnormal symptoms, such as offensive or suppressed lochia, will be treated as gynæcological and obstetric principles direct. In alcoholic cases, the wisdom of giving small doses of alcohol from the outset has been definitely established. In the absence of any special indications, the treatment is one of a general toxæmia of unknown origin. Blood cultures have been repeatedly made in such cases in the hope of finding some specific organism but with little success. Many of the patients show large numbers of septic sores and pustules which suggest a septicæmic state, and vaccines may be prepared from these and used. Search has long been made for substances which, when injected, will produce a sustained and beneficial leucocytosis in these cases, but whatever may be the theoretical merit of many with which experiment has been made they are rarely of practical help in treatment. Rectal salines are of great use, but it is almost impossible to get the patient to retain them. The constant and exhausting restlessness may sometimes be quietened by tepid sponging, and a cold pack sometimes works like a charm. Frequently, however, the restlessness is so intense and noisy that sedative drugs must be given. This should never be unduly delayed. Such drugs wisely used are a direct means of combating the intense and frequently fatal exhaustion which the sustained restless struggling is doing much to hasten. Paraldehyde is by far the safest and best. It can be given in doses of half an ounce with perfect safety, and repeated ad lib. In a really acute case, however, it may fail to act for more than a very short time, if at all, and recourse must be had to more powerful agents, of which a mixture of morphine (gr. ¼) and hyoscine (gr. 1/75) is probably the best.

Most important of all is the question of food, and it is here that the course of the case lies so largely in the nurse's hands. Not only are the patient's digestive functions more or less in abeyance, but complete refusal of food is a usual characteristic of these cases. Any form of liquid nourishment which the patient can be induced to take is permissible. It should, of course, be given often and in small quantities, and a food chart must be kept on which the amount and nature of the food, and the time of its administration, are noted. The patient is usually far too ill to show any preference for one variety of nourishment rather than another, but may sometimes do so in obedience to hallucinations, or perhaps during a brief lull in his condition. Any such preference should at once be regarded. If the refusal of food is absolute and continued for a day, tube feeding must be resorted to without hesitation. This is an infinitely simpler proceeding than is often imagined, and may be carried out with perfect safety and confidence by any practitioner. The nasal method is easiest and best. The tube should be about the size of a No. 15 catheter, and is joined by a small glass connexion to another rubber tube and glass funnel. The rounded distal end slightly lubricated with oil or glycerine is passed quietly and steadily along the floor of the nose. It will be found that one nostril is almost always very much easier than the other for this purpose. When the tube goes down into the back of the throat it is still moved gently and slowly onwards until a swallowing reflex is evoked and one can feel that it is within the grasp of the pharynx. It can then be pushed boldly onwards. Occasionally, owing to very rapid insertion or undue softness of the tube, it curves forward into the mouth instead of passing into the œsophagus, in which case it must be withdrawn and another more gentle attempt made. The only possible danger is the entrance of the tube into the larynx, and this is so exceedingly rare and produces such obvious signs when it occurs, that it need be no ground for hesitation or alarm. The proceeding is by no means painful, but a delirious patient usually has to be carefully held and controlled while it is carried out. There are many methods of doing this, a simple and effective one being as follows: The patient being on his back, one assistant lies across the bed, his chest coming over the patient's thighs well above his knees. With his hands, which are both free, this assistant holds the hand of the patient which is furthest from him. The second assistant holds the other hand, while a third controls the head, with the aid of a broad towel round the patient's forehead, if necessary. By this means the most violent patient can be controlled with perfect ease, and without possibility of harming him; but in many cases two assistants are amply sufficient. After the tube has been passed, it is wise to introduce first of all a small quantity of water through the funnel to satisfy oneself that the tube has been properly passed into the stomach and that the passage is clear. Milk, custard, and liquid foods of all kinds can be administered in this way, as well as any necessary aperient or hypnotic drug. Sugar and fruit juice are useful additions to a feed. Unfortunately, delirious cases show a remarkable tendency to vomit the food given almost as it enters the stomach. Deftness in introducing the tube and rapidity in withdrawing it will do much to prevent this, but it is a constant and troublesome complication. On more than one occasion during the war, when facilities for dealing with such cases were not good, I had to resort to administering a general anæsthetic after the introduction of the tube, and giving the food and withdrawing the tube while the patient was anæsthetised. This, however, is a last resource, which is not to be recommended. The giving of small quantities greatly lessens the risk of vomiting and a preliminary wash out of the stomach is often of help. As the most intense phase of the delirium passes, the patient can generally be induced to take sufficient food of his own accord. Improvement is rapid, though the confusion tends to come and go in waves before it finally disappears. The further treatment is that of convalescence from acute, exhausting, and dangerous illness.

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Special Articles.

MEDICINE IN PARLIAMENT.

Death Certification: An Agreed Bill.

The House of Commons, when it is formally opened on Jan. 15th, will include ten medical men among its Members, and if the position of the political parties in Parliament is likely to limit the passing of controversial measures, there is the better opportunity to pass certain non-controversial measures on matters connected with public health.

Law of Death Certification as it Stands.

One such matter, on which legislation is long overdue and which might claim the immediate attention of the Medical Committee, is the certification of death. There seem only two possible elements of controversy: one is the criticism which might be focused upon the suggestion that a number of new officials were being created; the other is the prospect of adding fresh burdens to those which the taxpayer already endures, although money spent on improving our knowledge of the vital statistics of the people may perhaps more properly be regarded as an investment. There is an urgent need for a Bill which will leave no room for the certification of death on insufficient information and which holds out reasonable prospect of eliminating the risk of premature burial or of failure to detect foul play. The present condition of the law is admittedly unsatisfactory. The Select Committee on this subject in 1893 reported that it was possible for evilly-disposed persons to inform a doctor that a patient whom he has been attending has died when such is not the fact, and to obtain a certificate of the cause of death based upon the doctor's previous knowledge of the case. The significance of this was shown in a remarkable trial at Edinburgh six years ago, when two women were charged with thus defrauding insurance companies between the years 1912 and 1917. There were some strong judicial remarks when the judge discovered that the Births and Deaths Registration Act did not prevent a doctor from certifying death without seeing the body. The Departmental Committee on Coroners' Law in 1909 reported that the existing state of the law "offers every opportunity for premature burial and every facility for the concealment of crime." Two Bills, on which we commented at the time,[1] Major L. Molloy's "Coroners' Law and Death Certification (Amendment) Bill" and Dr. A. Salter's "Deaths Registration and Burials Bill," were introduced into Parliament last year, but made no headway. An agreed Bill has now been drafted by a committee convened by the Federation of Medical and Allied Services. It omits Dr. Salter's proposals for "Public Certifiers of Deaths," and it excludes some of the provisions made by Major Molloy for the improvement of the law of coroners. It contains the main safeguards which the two previous Bills were designed to secure; it should not be costly to work, and we recommend it to the support of the medical profession in and out of Parliament.

Provisions of the Agreed Bill.

The chief features of the Bill are these. It proposes that, when a death occurs, information shall be given to the registrar within two days instead of the five-day period at present allowed by the 1874 Act. Every death and every stillbirth is to be registered, but no registration is to take place unless and until the registrar has received a medical certificate first of the fact of death, and secondly of the cause of death. The fact of death is to be certified by a registered medical practitioner who has viewed or examined the body and is satisfied that life is extinct. If possible this will be done by the doctor who last attended the deceased; if this is not possible, the person whose duty it is to notify the death must inform the registrar, and the registrar within 24 hours must inform the coroner, the coroner then appointing a doctor for the purpose. So much for the fact of death. The cause of death is similarly to be certified if possible by the doctor who attended the deceased. If the deceased was unattended, or if the doctor cannot, or does not, give the requisite certificate, the registrar must report the fact to the coroner. These two certificates are to be given on prescribed forms of a distinctive colour, verifiable by means of numbered counterfoils. The practitioner making such a certificate must deliver it within 48 hours to the registrar or to the relative or other person having charge of the remains; in the latter case such relative or other person must himself deliver it to the registrar within 24 hours. Having set up this procedure by which these medical certificates are made indispensable preliminaries to the registration of death, the Bill goes on to provide that human remains are not to be disposed of except upon the authority of a registrar's death certificate or of a coroner's order. The registrar's certificate goes to the "disposal authority"—i.e., the person or body in control or management of the burial-ground, churchyard, cemetery, or authorised crematorium. The person in charge of the register kept at any such burial-ground, &c., must endorse on the certificate a signed statement of the date, place, and mode of disposal of the remains, and must send the certificate back to the registrar within 24 hours. If the registrar does not duly receive it with its endorsement, he is to notify the medical officer of health, who will inquire into the disposal of the body, and will report in writing to the registrar. The Bill provides for duplicating a lost certificate; it also prohibits the retention of human remains in a house in cases not already covered by the Public Health Acts, and it restricts and regulates the disposal of more than one body in a coffin. Of special interest to the medical profession is the proviso (which Major Molloy's Bill had contained) that no practitioner can be required to analyse the contents of a body if he states that he is unable or unwilling to do so. The proposed fee for a medical certificate is half a crown plus a mileage allowance; poor persons' fees will be paid by the guardians or overseers; and there is provision for fees where a doctor acts at the request of a coroner. The machinery thus set up is backed by penalties which are perhaps not very heavy in view of the serious malpractices which the Bill is designed to prevent. The machinery seems adequate to the purpose. If any of our readers can see any dangerous loophole in the proposals, now is the time to draw attention to it.

One other point of importance is the direction that registrars shall furnish gratis to doctors to whom forms are issued a classification of diseases. This standardisation, which doctors are to adopt as far as is practicable in their certificates, will notably improve the statistical information from which important deductions may be expected. The margin of ill-defined deaths has been reduced in recent years, but it is still too large.

Whether or Not to Abolish the Office of Coroner.

In a lecture delivered on Dec. 5th last at the Royal Institute of Public Health by Dr. A. H. Bygott, medical officer of health for West Suffolk, the abolition of coroners was boldly advocated. Dr. Bygott suggested that the medical officers of health of counties and county boroughs should be responsible for determining the cause of death by post-mortem bacteriological chemical examinations or otherwise, and that the legal departments of these local authorities, with the coöperation of the police, should be responsible for holding inquiries in public or in private as to deaths, and for the prosecution of offences in connexion therewith. It is true that the ancient office of the coroner is neither perfect nor indispensable. Critics find it not wholly suited to

[1] The Law of Coroners, The Lancet, 1923, i., 1321.

modern conditions. Scotland has managed to get on very well without it. The only "inquest" known to Scots law is the inquiry as to deaths in prisons: for all other purposes the Fatal Accidents Acts suffice, and the procedure by which the Procurator Fiscal inquires into the cause of sudden or suspicious deaths, the results of such inquiries being transmitted to the Crown Agent in Edinburgh. Nevertheless, we believe that the Bill, which we have outlined above, stands the better chance of becoming an Act of Parliament by avoiding, as it does, any attack upon an ancient institution to which the English public somehow seems attached. The Bill has been drafted by a body representative of all interests concerned. Its proposals are so marked an advance upon the existing law that we should deprecate any alteration of its agreed terms which might jeopardise its career through Parliament.

MEDICAL RESEARCH COUNCIL.

REPORT FOR THE YEAR 1922–23.[1]

THE general plan of the annual reports of the Medical Research Council has now become as familiar as the general policy governing the expenditure of the sum, this year £130,000, annually entrusted to them for disbursement. Approximately a third of this grant-in-aid is allocated to meet the expenses of the National Institute for Medical Research at Hampstead and of the associated field laboratories at Mill Hill, and the rest of the money, apart from a modest provision for expenses, is devoted, as in previous years, to research grants for laboratory and clinical work on specific subjects carried on throughout the country and to the investigations of the Industrial Fatigue Research Board.

The fact that the list of those working under a grant or in honorary association with the activities of the Council contains 593 names and that the bodies or institutions at which correlated work is being carried out are 34 in number is sufficient evidence of the extensive nature of the aid given and of the broad field covered by the sympathetic interest of the Council. On the financial side attention is drawn to certain direct additions made to the material resources of the Council, which have made it possible to undertake a much more ambitious programme than would have been feasible had the Parliamentary grant-in-aid not been thus augmented. Important grants for particular extensions of work have been made by the Carnegie Trust of the United Kingdom (£2000), by the Dental Board of the United Kingdom (£3000), by the Miners' Welfare Fund (£500), and by the Health Committee of the League of Nations (8000 Swiss francs). Grants-in-aid of work jointly undertaken have been made by the Ministry of Health and by the Department of Scientific and Industrial Research. Contributions have been made by industrial associations to the cost of work undertaken by the Industrial Fatigue Research Board appointed by the Council. Various gifts of money have been received from individual benefactors to assist particular schemes of research work. The Council express grateful acknowledgments to the donors of these gifts, which are rightly to be regarded as gifts to the nation for the national enterprise of research. The generous allocation by the Rockefeller Foundation of the sum of $50,000 to be entrusted to the Medical Research Council for the provision of Fellowships [2] in medicine tenable in the United States during a period of three years is noted as one of the most important benefactions of the year.

Changes in the personnel of the Council itself for the year ending Sept. 30th, 1923, have been recorded in our columns as they occurred. The present constitution of the Council and of the committees called together for special investigation is set out below.

[1] London: His Majesty's Stationery Office. 1923. 3s. 6d.
[2] THE LANCET, 1923, i., 1323.

The Medical Research Council.

Viscount Goschen (Chairman), Lord Mildmay of Flete, P.C. (Treasurer), Mr. William Graham, M.P., Sir Frederick Andrewes, M.D., F.R.S., Prof. Georges Dreyer, M.D., F.R.S., Prof. T. R. Elliott, M.D., F.R.S., Sir Archibald E. Garrod, M.D., F.R.S., Dr. Henry Head, F.R.S., Prof. D. Noël Paton, M.D., F.R.S., Sir Cuthbert S. Wallace, F.R.C.S., Sir Walter M. Fletcher, M.D., F.R.S. (Secretary).

Investigation Committees for Special Subjects.

Biological Standards and the Methods of Biological Assay.—Prof. William Bulloch (chairman), Sir Frederick Andrewes, Dr. H. H. Dale, Prof. Georges Dreyer, Sir Walter Fletcher, Prof. C. J. Martin.

Bacteriology (formerly Pathological Methods).—Sir Frederick Andrewes (chairman), Prof. Bulloch, Captain S. R. Douglas (secretary), Prof. Dreyer, Dr. Paul Fildes, Prof. J. C. G. Ledingham, Dr. C. G. L. Wolf.

Anthropometric Methods and Standards.—Sir Arthur Keith (chairman), Lieut.-Colonel C. R. Sylvester-Bradeley, R.A.M.C., Dr. John Brownlee, Prof. Dreyer, Group-Captain Martin Flack, R.A.F., Dr. F. G. Hobson (secretary).

Ante-Natal and Post-Natal Problems of Child Life.—London Committee: Dr. G. F. Still (chairman), Dr. John Brownlee, Dr. Hector C. Cameron, Dr. J. S. Fairbairn, Dr. Eardley L. Holland, Dr. R. C. Jewesbury, Prof. M. S. Pembrey, Dr. O. L. V. de Wesselow (secretary). Scottish Committee: Prof. D. Noël Paton (chairman), Dr. A. K. Chalmers, Dr. Leonard Findlay, Dr. T. Y. Finlay, Dr. G. B. Fleming, Prof. J. M. Munro Kerr, Sir Leslie Mackenzie, Prof. B. P. Watson, Miss Jean Agnew (secretary).

Eclampsia (jointly with the Obstetrical and Gynæcological Section of the Royal Society of Medicine).—Dr. T. W. Eden (chairman), Mr. A. W. Bourne, Dr. Eardley L. Holland, Prof. Louise McIlroy, Dr. A. J. McNair, Dr. Everard Williams, Dr. Herbert Williamson (secretary).

Accessory Food Factors ("*Vitamins*") (appointed jointly with the Lister Institute of Preventive Medicine).—Prof. F. Gowland Hopkins (chairman), Miss Harriette Chick, D.Sc. (secretary), Mr. J. C. Drummond, D.Sc., Prof. Arthur Harden, Mr. W. B. Hardy, Dr. A. W. J. MacFadden, Prof. C. J. Martin, Prof. Edward Mellanby.

Quantitative Problems of Human Nutrition.—Prof. E. P. Cathcart (chairman), Dr. Major Greenwood (secretary), Dr. Leonard Hill, Dr. A. W. J. MacFadden, Sir Thomas Middleton, Prof. D. Noël Paton, Prof. T. B. Wood.

Causes of Dental Disease.—Prof. W. D. Halliburton (chairman), Dr. Norman G. Bennett, Dr. Leonard Colebrook, Mr. W. H. Dolamore, Dr. J. M. Hamill (secretary), Sir Arthur Keith, Mr. P. P. Laidlaw, Mrs. M. Mellanby, Dr. J. Howard Mummery, Dr. C. J. Thomas.

Clinical Uses of Oxygen.—Prof. T. R. Elliott (chairman), Prof. F. R. Fraser, Dr. G. H. Hunt (secretary), Prof. J. C. Meakins, Dr. E. P. Poulton.

Injuries of the Nervous System.—Dr. E. Farquhar Buzzard (chairman), Mr. W. Rowley Bristow, Dr. J. G. Greenfield, Dr. Henry Head, Dr. George Riddoch (secretary), Mr. Percy Sargent, Mr. Wilfred Trotter.

Mental Disorders.—Dr. Henry Head (chairman), Dr. Thomas Beaton (secretary), Dr. C. H. Bond, Dr. Henry Devine, Prof. G. Elliot-Smith, Sir Frederick Mott.

Tuberculosis (Subcommittee at present organised under a Committee of the Council, of which Dr. A. S. MacNalty is th Secretary).

Tuberculin.—Capt. S. R. Douglas, late I.M.S. (chairman), Mr. W. Buckley, Dr. L. S. T. Burrell, Prof. J. B. Buxton, F.R.C.V.S., Prof. Dreyer, Mr. J. Macintosh, Dr. MacNalty, Dr. H. H. Thomson, Dr. P. C. Varrier-Jones, Dr. G. T. Western, Prof. T. B. Wood.

Bacteriology of Tuberculosis.—Prof. Dreyer (chairman), Dr. R. G. Canti, Prof. S. L. Cummins, Dr. A. Stanley Griffith, Dr. A. C. Inman, Dr. MacNalty (secretary).

Salvarsan.—Sir Humphry Rolleston (chairman), Sir Frederick Andrewes, Prof. William Bulloch, Dr. F. J. H. Coutts (secretary), Dr. H. H. Dale, Dr. L. W. Harrison, Dr. J. W. McNee.

Canine Distemper.—Prof. C. J. Martin (chairman), Prof. J. B. Buxton, F.R.C.V.S., Capt. S. R. Douglas, Prof. F. Hobday, F.R.C.V.S., Mr. A. L. Thomson, D.Sc. (secretary).

Radiology.—Sir Cuthbert Wallace (chairman), Dr. C. Thurstan Holland, Dr. E. H. Kettle, Dr. Robert Knox, Sir Humphry Rolleston, Prof. Sidney Russ (secretary), Prof. S. G. Shattock.

Biological Actions of Light.—Sir William Bayliss (chairman), Mr. J. E. Barnard, Dr. H. H. Dale, Capt. S. R. Douglas, Prof. Dreyer, Sir Henry Gauvain, Dr. Leonard Hill, Dr. J. Henry Sequeira, Mr. Edgar Schuster, D.Sc. (secretary).

Cinchona Derivatives and Malaria.—Dr. H. H. Dale (chairman), Major H. W. Acton, I.M.S., Dr. Andrew Balfour, Lieut.-Colonel S. P. James, late I.M.S.

Properties of Hæmoglobin.—Mr. Joseph Barcroft (chairman), Sir William Bayliss, Dr. H. H. Dale, Dr. C. G. Douglas, Prof. C. A. Lovatt Evans, Mr. W. B. Hardy, Dr. H. Hartridge, Prof. Laurence J. Henderson (Harvard), Prof. A. V. Hill, Dr. J. H. Burn (secretary).

Physiological Actions of Alcohol.—Prof. A. R. Cushny, Dr. H. H. Dale, Dr. Major Greenwood, Sir Frederick Mott, Dr. C. S. Myers, Sir Charles Sherrington, Dr. W. C. Sullivan.

Use of Pituitary Extract in Labour (jointly with the Obstetrical and Gynæcological Section of the Royal Society of Medicine).—Dr. H. Russell Andrews (chairman), Mr. A. W. Bourne, Dr. H. H. Dale, Dr. Malcolm Donaldson (secretary), Dr. J. P. Hedley, Prof. Louise McIlroy.

"Status Lymphaticus" and Causes of Unexplained Death (jointly with the Pathological Society of Great Britain and Ireland).—Dr. G. M. Duncan, Prof. J. Shaw Dunn, Prof. F. Emrys-Roberts (secretary), Prof. E. E. Glynn, Dr. J. E.

McCartney, Prof. Matthew J. Stewart, Prof. H. M. Turnbull, Prof. G. Haswell Wilson.

Miners' Nystagmus.—Dr. J. S. Haldane (chairman), Prof. E. L. Collis, Dr. T. L. Llewellyn (secretary), Mr. G. H. Pooley.

The Industrial Fatigue Research Board and the Related Scientific Committees.—The Board: Mr. William Graham, LL.B., M.P. (chairman), Mr. R. R. Bannatyne, Mr. C. J. Bond, Mr. W. L. Hichens, Dr. C. S. Myers, Sir Joseph Petavel, Sir Charles Sherrington, Prof. E. H. Starling, Miss Mona Wilson, J.P., Mr. D. R. Wilson, M.A. (H.M. Inspector of Factories) (secretary).

Industrial Health Statistics.—Dr. Major Greenwood (chairman), Dr. John Brownlee, Prof. E. L. Collis, Mr. Alfred Henry, F.I.A., Dr. Leonard Hill, Mr. L. Isserlis, Dr. A. S. MacNalty, Mr. G. Udny Yule, Mr. T. Lewis-Faning (secretary).

Physiology of Muscular Work.—Prof. E. H. Starling (chairman), Prof. E. P. Cathcart, Prof. A. V. Hill, Prof. M. S. Pembrey, Dr. B. A. McSwiney (secretary).

Industrial Psychology.—Dr. Henry Head (chairman), Mr. F. C. Bartlett, M.A., Mr. Cyril Burt, M.A., Dr. C. S. Myers, Prof. T. H. Pear, Sir Charles Sherrington.

Legibility of Type.—Sir John Parsons (chairman), Mr. F. C. Bartlett, M.A., Dr. H. Hartridge, Mr. L. A. Legros, M.I.C.E., Mr. E. Schuster, D.Sc. (secretary).

Two Groups of Inquiries.

In the introduction to the report which is signed by Lord Goschen as chairman and Sir Walter Fletcher, F.R.S., as secretary, it is pointed out that the work of which the Council now presents an account will be found in the main to fall within two groups, not sharply distinct. On one hand there are studies which will seem to all readers to have obvious importance as pieces of medical research directly applied to the better maintenance of health or the better treatment of disease. Their urgency and value are at once obvious. On the other hand, there is no less important work of which the nature and purpose cannot so easily be appreciated, and the bearing which it has upon the improvement either of medicine or hygiene may seem more remote.

The Council finds it easy enough to get general approval for direct experimental study of particular diseases in the hope of gaining means of cure or prevention. All, again, can see the importance of finding the best physiological conditions for bodily labour of different kinds, or of studying the actions of light upon the body and the interplay of sunshine and nutritive factors in healthy growth.

It is in the latter group of studies, including perhaps the greater part of the work which the Council are supporting, that the chief difficulties of justification within short compass are found. It is not easy to explain, except at great length, the relations which studies of this kind have to the problems of practical medicine. Work upon detached points in biochemistry investigations of the laws of bacterial growth under given conditions, studies of cell life and organisation, inquiries into the behaviour of colloidal substances, all these seem often not only to the lay public but even to the practising doctor to be far divorced from useful human purposes. Neither the volume nor the value of the highly elaborate, patient, and unadvertised work which is being done in these apparently academic directions is generally realised. It goes forward, filling gaps in knowledge and forging new weapons for further work by finding new methods or instruments of research. Abundant experience is available to show that at any moment some piece of knowledge or some new laboratory method emerging from research work of this kind may bring altogether unexpected aid to the solution of some practical problem and so, whether early or late, find its fruition.

Their Inter-relations.

Effective illustration of the relations between these two intermingling groups of work is drawn from what the report describes as perhaps the most conspicuous medical event of the past year—the introduction to practical therapeutics of insulin. It is emphasised—not in order to belittle the Canadian workers, but to give their excellent work its due credit as a scientific and not a chance discovery—that this sort of "discovery" is the end-point of a long series of scientific steps each of which was as truly a "discovery" and each of which was accomplished by men exceptionally gifted. Some at least of these efforts made on these lines in the past were probably abortive for want of parallel progress in the technical methods available for rapid estimation of small quantities of sugar in the blood. The brilliant result of a bravely renewed attack upon a problem which many of their predecessors had abandoned as almost hopeless by Dr. F. G. Banting, Mr. C. H. Best, Prof. J. R. R. MacLeod, and Dr. J. B. Collip, of Toronto University, is now a matter of world history. We rejoice that the report mentions Dr. Collip's name in this connexion, for it is apt to be forgotten that while Banting put out of action the trypsin secreted by the main pancreatic glands by a preliminary ligature of the ducts, it was Collip who devised a means of achieving a similar result on a large scale by the use of alcohol.

The Application of Funds to Promote Medical Progress.

The Council notes that there are signs in some directions of a growing tendency to yield to the temptation to give or to ask money not for the steady cultivation of knowledge along the natural lines of growth, but for the attempted purchase of practical fruitfulness before its time. Stimulated by notable and obvious achievements like the production of diphtheria antitoxin, preventive inoculation against typhoid, the defence against scurvy and rickets through dietetic knowledge, the control of body function by pituitary extract or by insulin, the public, and indeed some parts of the medical profession, are tempted to think that money collected directly for the discovery of similar practical boons, or that rewards offered to particular discoverers, will aid progress, instead of learning the lesson of experience and seeking the due provision of money for disinterested scientific work and the due support of the ablest scientific men to do it. As the Council said in its annual report four years ago, and now repeats, power to prevent or cure a disease must not be expected to come by sudden discovery, nor often as the result of a special campaign, however vigorously prosecuted. Rapid gains, often unforeseen and in unexpected directions, may be confidently expected, however, so long as the area of accurate knowledge is maintained in its growth; we cannot foretell the flow of water here and there in the irrigating channels along a shore, but we know that the flow must certainly follow whenever the tide raises the general level of the waters.

Animal Experiments.

The Council draws attention from another point of view to the production and successful use of insulin in the treatment of diabetes. The functions of the pancreas in the control of diabetes were first elucidated by the study of diabetes artificially inflicted upon dogs. At every subsequent stage in progress animal experiment has been necessary, and even now every batch of insulin must be tested upon animals for the assessment of its potency. The great service rendered by animals to mankind, of which this is only one example, must be counted as a higher service than that which is given by animals to provide the clothing, the food, or the amusements of mankind. It is plainly right that this high service should be gratefully recognised and openly acknowledged by the whole community that takes advantage of it. In their last annual report the Council referred at some length to their hopes for a better organisation in this country of the study of animal diseases, which, quite apart from the benefits to be expected from it for agriculture, and, through the veterinary profession, for the benefit of all domesticated animals, must bring invaluable help to medicine. The veterinary and medical sciences are not different sciences, but occupy the same field of pathology, which both in theory and practice must always be a comparative pathology. On this account the Council cordially welcome the establishment of a chair and a school of animal pathology in the University of Cambridge.

The National Institute of Medical Research.

The 17 pages devoted to admirably condensed summaries of the type of investigations being undertaken in the six departments of the Institute are well worth careful study. It has fallen to the Department

of Biochemistry and Pharmacology, under the direction of Dr. H. H. Dale, F.R.S., to undertake the arduous task of organising the preliminary trials, methods of preparation and standardisation of insulin, and Dr. H. W. Dudley is now engaged in investigating its chemistry. Dr. J. H. Burn has observed an interesting antagonism between extracts of the posterior lobe of the pituitary body and insulin in their effects on the blood-sugar. It is interesting to learn that the conclusions reached by Dr. Dale and Dr. H. King, working in association with Dr. C. F. Hadfield, on the anæsthetic action of pure ether (THE LANCET, March 3rd, 1923) have been completely confirmed by the concurrent and independent observations of Prof. Storm van Leeuwen and his colleagues at the University of Leiden, who find that ether purified by crystallisation with organic substances retains its full anæsthetic potency. In the Department of Experimental Pathology, Bacteriology, and Protistology, Captain S. R. Douglas, F.R.S., the director, has undertaken experimental work on the nature and actions of diaplyte vaccine, introduced by Prof. G. Dreyer, and during the early part of the year continued his investigations into rat leprosy, this work having been more recently undertaken by Dr. P. P. Laidlaw, with encouraging results. Dr. W. E. Gye has developed his work with Dr. W. J. Purdy on the action of colloidal silica administered to animals, and is now devoting most of his time to the study of filter-passing organisms, and has cultivated such an organism from chicken sarcomas. Dr. Laidlaw has studied the nutrient factors which stimulate the growth of bacteria, Dr. Percival Hartley has been mainly occupied in the preparation of a standard diphtheria antitoxin, while Mr. Clifford Dobell, F.R.S., has continued his work on the improvement of technical methods for the investigation of very minute organisms, and his studies of the amœba, coccidia, and spirochætes which infect man. In the Department of Applied Physiology, Dr. Leonard Hill, F.R.S., the director, Dr. J. Argyll Campbell, and other workers have continued their studies of the chemical exchanges of the body and their efficiency, undertaken with special reference to open-air treatment of disease and to the hygiene of physical labour. Dr. Major Greenwood (Ministry of Health) has received accommodation in the Institute for statistical inquiries, and has coöperated with the staff in various ways. The Council records its continued indebtedness to Mr. J. E. Barnard for his honorary services as director of the Department of Applied Optics. For better study of the biological actions of light a photometric method of measuring the relative energies of ultra-violet radiations has been adopted. A brief note of the work of the Statistical Department (Dr. John Brownlee, director, and Dr. Matthew Young), and of the Library and Publications Department concludes this section of the report.

Biological Standards: Research Work in Clinical Units.

The third section of the report is devoted to the determination of biological standards and the methods of biological assay and measurement. This includes a description of the work done upon biological standards at the National Institute for Medical Research, an account of the national collection of type cultures, the production of standard diagnostic sera and cultures, a discussion of international serological standards, and of anthropometric methods and standards of medical measurement. The Council's Department of Clinical Research is housed at University College Hospital, London, under the direction of Sir Thomas Lewis, F.R.S., and a long list of publications testify to the excellent original work being carried out by the director, Dr. A. N. Drury, Dr. R. T. Grant, Dr. C. C. Iliescu, and the large number of voluntary workers from all parts of the world who have considered it a privilege to work in the department. These include Dr. T. F. Cotton, Dr. A. Sebastiani (of Rome), Dr. W. Horsfall (of Sydney), Dr. C. W. Munley (of Portland, Oregon), Dr. H. L. Blumgart (of Boston), Dr. J. J. Sumbal (of Bratislava), and Dr. F. Smith (of Chicago). The research work being done under grants from the Council at various other London, provincial, and Scottish hospitals is also indicated. Mostly this work is again referred to in more detail in the next section of the report entitled

Research in Specific Subjects.

We shall have to return on innumerable occasions to the consideration of the mass of work described as in progress throughout the country. It must suffice here to give a list of the headings into which it is classified and to recommend this section of the report for special study. The headings include: Problems of Child Life—Rickets, Accessory Food Factors ("Vitamins")—Studies of Deficiency Diseases in Central Europe, Human Nutrition, Dental Disease, Disorders of the Cardio-vascular System, Exophthalmic Goitre (Graves's Disease), Disorders of the Respiratory System, Disorders of the Excretory System, Disorders of the Nervous System, Mental Disorders, Tuberculosis, Studies of the Streptococcus and Pneumococcus Group, Diphtheria, Venereal Diseases, Filtrable Viruses—Canine Distemper, Diabetes and Insulin Treatment, Arthritis, Malignant Disease, Radiology and Radiotherapy, the Biochemical Actions of Light, General Biochemical Researches, General Physiological and Pathological Researches, Experimental Epidemiology, Metazoan Parasitology.

Conclusion.

After a section devoted to industrial medicine and industrial fatigue a concluding paragraph of the report pays a special tribute to the invaluable aid given to the Council's work by the numerous scientific men who have been willing to give their time to serving on committees in charge of particular investigations. The list of investigation committees set out above is the clearest proof that there are few subjects of topical and urgent medical interest which are not receiving the earnest attention of the Medical Research Council. It is not possible to do justice in any summary of so pithy and condensed a report as this one. We can only hope to indicate its scope.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

The New Medical Bill.

THE representatives of the medical profession have now been informed of the leading principles underlying the proposed Medical Act which the Government is about to lay before the National Assembly. That the Medical Council was not even invited to coöperate in drafting the principal clauses of this Bill was considered, at the time, as an insult to the profession, and now it is anticipated that the contents of the Bill will cause even wider dissatisfaction among doctors. The promises made to the profession within the last three years would appear to have been forgotten, and the desire to control the rights and duties of doctors by non-medical men is manifest. Thus, for instance, a disciplinary court consisting of four doctors and five lawyers or officials is entrusted with the control of professional infringements of law, but of these four medical men two are to be chosen from State officers of health. This court would have power to strike the name of a culprit off the Medical Register for a period of one to six years. All minor offences would go before the Medical Council, but all serious cases would be judged by this largely non-medical court. A chapter deals with professional secrecy. Under the new Act the doctor would be bound to disclose to the judge in a court of law any details about his patients that might be demanded, and important "personal or public interests" would justify a breach of professional secrecy! At present a doctor is not bound to take over the treatment of a patient except in case of urgent need—in this Bill

no doctor may refuse professional help unless absolutely unable to do so. As regards the medical curriculum, the old desideratum of the profession—viz., that a compulsory "hospital year" be added to the normal five and a half years' course of training of the medical student will not be realised, but a clause states, that in certain conditions this additional year might be stipulated "if found advisable." In a word, the Bill violates the all-important principle that affairs pertaining to the welfare of a certain profession be controlled by members of that particular profession only. It is not to be wondered at that the articles and clauses as stipulated in the suggested Act are far from finding the approval of those most concerned. A strenuous fight against such bureaucratic methods is natural, and the profession is once more firmly united in the struggle for self-determination.

Experimental Principles in the Treatment of Cardiac Insufficiency.

At a recent meeting of the Vienna Biological Society Prof. Wiechowsky read an interesting paper on the above subject, in which he stated that the modern researcher decides the possible remedial efficacy of various substances from the analysis of their experimental effects on the organs. Information thus obtained is more reliable than the knowledge gained by general experience and bedside indications alone, but laboratory findings must be controlled by clinical observations. He reported chiefly on the results of his experiments conducted solely on the frog's heart with a view to ascertaining the correct use of cardiac analeptics. The hearts were completely anæsthetised with chloroform and other toxic drugs, and the substances used as analeptics were: caffeine, adrenalin, digitalis, camphor, calcium salts, and physostigmine. He finds that caffeine can be used universally as an analeptic for all conditions of cardiac insufficiency. The derivatives of digitalis are useful only where failure of compensation through organic valvular disease has taken place. Camphor increases the minute-volume of blood only in cases of fibrillation (extra-systole). Its action in this respect is identical with that of strychnine or quinine, and has an equally weakening effect on the muscular action. Therefore it should be combined with caffeine or digitalis. Adrenalin throws extra work on the cardiac muscles by increasing the pressure. Therefore it should not be used alone in cardiac insufficiency; its chief indication is collapse due to paralysis of the central vaso-motor centres, the heart being otherwise intact. The cardiac analeptics should be injected intracardially in all instances of severe insufficiency or even in cases of complete standstill of the heart. Even after a few minutes of absolute cessation, heart-beats may be recommenced by this procedure. Before starting a chloroform narcosis, caffeine or theobromine should be injected subcutaneously so as to prevent a syncope.

Justification of Artificial Abortion: A Medical Protest against Present Jurisdiction.

In my letter of Dec. 15th, 1923, I called attention to the alarming increase of criminal abortion in Austria as instanced by Prof. Latzko, and referred to a growing body of opinion which was endeavouring to legalise artificial abortion before the third month of pregnancy. The law, however, maintains a very uncompromising attitude of unremitting severity towards any such procedure. Several months ago, as I mentioned in a previous letter (THE LANCET, June 23rd, 1923) the Supreme Public Prosecutor issued an order to all medical corporations, boards of health, and hospitals, demanding that in every instance of abortion where an external cause might be suspected, a report should be made to the police by the doctor or midwife. This attempt to tamper with professional secrecy was absolutely repudiated by the profession, and it may be stated that neither in hospitals nor in private practice were any questions asked which might have caused trouble to the woman. But quite recently the High Court took opportunity to commit two eminent members of the Vienna medical world for trial because the one had advised the inducement of an artificial abortion, and the other had operated on the woman in question. Both were sentenced to three months' imprisonment on the testimony of the forensic expert, who stated that from the data obtained from the patient after several months and from the notes of the case-history in the private cottage hospital, he had come to the conclusion that the abortion was not a matter of necessity. The point is that while both men were fully qualified practitioners of some standing, the expert was a forensic pathologist, and as such no clinician. The incident caused a violent outburst of indignation in the profession; in mass meetings and in the press the present rôle of the forensic expert was severely criticised. In a resolution passed by the Medical Council and the meetings of the Specialists' Union, the Government was informed, in particular the Ministry of Justice, that the profession refused to be subjected to antiquated methods of jurisdiction. Medicine had made such enormous strides in the last 30 years that it was absolutely necessary to obtain the opinion of the clinician who was abreast with modern practical medicine, whenever medical problems were concerned. The pathologist, on the other hand, however high might be his standing in his own branch, lacked the experience obtainable only at the bedside of the patient. In judging the pros and cons of a case of abortion the Medical Council thought it "of paramount importance that a clinical expert be called upon to advise the judge and the court." This resolution also found a most hearty support in the public lay press. The reactionary turn taken lately by the bureaucracy and jurisdiction in this country is being much resented and commented upon by all sections of the community.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

THE following Surg. Comdrs. are placed on the ret. list with the rank of Surg. Capt.: S. Roach, J. Stoddart, R. S. Osborne, H. P. Turnbull, A. Woollcombe, and K. H. Jones.

Surg. Capt. R. A. Ross is placed on the ret. list with the rank of Surg. Rear-Admiral.

W. G. C. Fitzpatrick to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Temp. Capt. T. Bourne-Price relinquishes his commn. and retains the rank of Capt.

REGULAR RESERVE OF OFFICERS.

Lt.-Col. J. F. W. Sandison, late R.A.M.C., Militia, to be Lt.-Col.

TERRITORIAL ARMY.

Sanitary Companies.—Capt. J. Ogilvie resigns his commn. and retains the rank of Capt.

Supernumerary for Service with the O.T.C.—Maj. (Prov.) C. H. Carlton, from General List, to be Maj. (Prov.) for service with the London University Contingent, O.T.C.

TERRITORIAL DECORATIONS.

The King has conferred the Territorial Decoration upon the undermentioned officers: Lt.-Cols. T. A. Barron, D. J. Graham, J. M. Gover, W. Lister, G. S. A. Ranking (ret.), and D. G. Rice-Oxley; Majs. A. C. Goodwin, D. V. Haig, A. Ayre-Smith, and G. E. J. A. Robinson; and Capt. (Bt.-Maj.) C. W. Wirgman (ret.).

ANTI-OPIUM PROPAGANDA IN CHINA.—Dr. Chuan, formerly director of the Chinese Army Medical College for six years, has been appointed secretary of the Opium Committee of the National Christian Council of China, which has now moved from Shanghai to Peking, so as to be able the more effectively to work with Dr. W. H. G. Aspland, of the International Anti-Opium Association. Dr. Chuan graduated at Peiyang Medical College and afterwards studied at Johns Hopkins and Harvard. For a short time in 1922 he was Vice-Minister for Education, and last year he became director of the Central Sanitary Department, Peking. He expects to be chiefly engaged in providing anti-opium literature in Chinese, particularly for the Chinese Church.

THE CAPITATION FEE FOR INSURANCE PRACTICE.

THE OPENING SESSIONS OF THE COURT OF INQUIRY.

THE Court of Inquiry appointed by the Minister of Health to determine what should be the amount of capitation fee payable to insurance practitioners held its first sitting on Friday, Jan. 4th, at the Ministry of Health. The chairman of the Court is Mr. T. R. Hughes, K.C., the other two members being Mr. F. C. Goodenough and Sir Gilbert Garnsey, K.B.E. The minute of appointment directs the Court

"to enquire and report to His Majesty's Government what should be the amount of the capitation fee (per insured person per annum) on the basis of which the Central Practitioners Fund under Article 19 of the National Health Insurance (Medical Benefit) Regulations, 1924, should be calculated as from the 1st January, 1924, so as to afford adequate remuneration for the time and service to be given by general practitioners under the conditions set out in those Regulations, in connection with the medical attendance and treatment of insured persons, due regard being had to the service in fact rendered under the Regulations hitherto in force. This capitation fee is not to include any payment in respect of the supply of drugs and appliances (such payments being made out of the Drug Fund under Article 24 of the Regulations), nor any payments to meet the special conditions of practice in rural and semi-rural areas."

FRIDAY, JAN. 4TH.

In opening the proceedings the Chairman said the Court had before them the printed case submitted by the Insurance Acts Committee of the British Medical Association; the printed case of the Ministry of Health and the Secretary for Scotland; and a memorandum by the Medical Practitioners' Union. The Emergency Committee of the Approved Societies' Association had now decided to submit their views to the Court.

The Attitude of the Approved Societies.

Dr. Alfred Cox, medical secretary to the British Medical Association, entered a protest against the action of the approved societies who, after having stated that they did not intend to take part in the proceedings, had now, after the evidence of his association and of the other parties had been put in, changed their minds. It appeared that their action would delay the proceedings and postpone the report of the Court. The societies were "trying to make the best of both worlds"; he hoped they would come before the Court, but they should do so on the same terms as the other parties.

Mr. Scott, assistant secretary to the Emergency Committee of the Approved Societies' Association, stated that he was present with a watching brief to listen to the proceedings on behalf of the Emergency Committee. The approved societies proposed to give evidence at the request of the Ministry, but they had no desire to be represented at the inquiry that day. Their case would not be ready before the 20th.

The Chairman said that there seemed to be a misapprehension. The Ministry had not requested the societies to give evidence, but had intimated that they would be glad if the societies thought it desirable to do so. The representatives of approved societies should understand that they were at liberty to take part in the inquiry, but the inquiry could not be delayed until their case was put in. He hoped that the societies would prepare their case before the 20th.

Dr. Cox drew attention to the fact that Mr. Percy Rockliff, secretary of the Joint Committee of Approved Societies, was reported that morning in the press to have given as a reason for the decision of the societies to take part in the proceedings, the changed personnel of the Court. Apparently they did not think the Court was impartial until Sir Josiah Stamp was dropped out. His Association believed that the Minister of the Crown would not appoint a Court which was not impartial, and he felt it was due to the decencies of public life that a protest should be made.

The Chairman said that the matter mainly affected the Tribunal, which would be quite indifferent to it.

The Case for the Doctors.

Dr. H. B. Brackenbury, chairman of the Insurance Acts Committee of the British Medical Association, then gave evidence in amplification of the Association's printed case. He said that they were there in no partisan spirit; they desired to do all that they could to assist the Court of Inquiry. There were certain important points of principle which he would like to emphasise at the outset. (1) The medical profession as such was deserving of relatively high remuneration; all those indications which would justify a relatively high rate of pay were to be found in the medical profession. (2) Insurance doctors should, so far as possible, be placed on the same footing, financially, as the rest of the profession, otherwise the best men would be drawn to other branches of professional work. (3) The capitation fee was uniform throughout the whole service; therefore regard must be had to the higher as well as to the lower conditions prevailing in that service. (4) It was necessary that such a rate of payment should be given as would not only attract but also retain the services of first-class doctors.

The conditions of medical practice were to-day very different from those existing 10 or 12 years ago. Doctors had now to devote a great deal more time in investigating cases of illness. The general practitioner treatment of to-day to which the insured person is entitled was something larger than was in their minds when the National Insurance Act first came into operation. The doctors had themselves on several occasions suggested the enlargement and extension of the service, and it was the desire of the medical profession that a very complete general practitioner service should be available for the insured population. They must, however, have regard to the increase in the doctor's work consequent on the advance of medical science on the one hand and on the extended scope of general practitioner treatment on the other.

As regards the statistical side of their case, the figures had been prepared by Prof. Bowley, who had explored the subject as an independent statistician. The figures had been in no way modified by the Association. The conclusion drawn from these figures was as follows: Assuming that they applied all the economic principles which had been learned since the war and that they accepted the same relative standard of conduct, they would require, in order to maintain the 1913 standard of living, a capitation fee of something over 11*s.* as compared with the 7*s.* 3*d.* of 1913, and even then the relative saving capacity of the doctor would be reduced from £100 to £42—an amount barely sufficient to cover insurance premiums.

The Ministry had suggested a comparison with the fluctuations in the bonus paid to civil servants, but in their opinion this was not a satisfactory way of apprising relative values. It was a doubly doubtful analogy, for the alterations in the Civil Service bonus was in itself a doubtful method of deciding relative values, and to apply this doubtful test to the materially different conditions of the medical profession rendered the result still more doubtful. The Ministry had applied the Civil Service bonus figures to the maximum instead of to the average of the doctor's remuneration. Moreover, at no time had the increase in the insurance doctor's remuneration been adjusted to anything like the height of the Civil Service bonus. Apart from his pay, the civil servant received pension, holiday, and other advantages which had no counterpart in the doctor's practice. The only true analogy would be obtained if the value of these special benefits were deducted before the bonus curve were planned, their value being subsequently added to the resultant figure for the doctor's remuneration. With reference to the cost of carrying on a practice, it was clear that a reduction in cost of materials did not carry with it a

reduction of practice expenses in the same proportion. Considering only non-dispensing practices, he considered that the average practice expenses were about 25 per cent. of gross income.

There were certain validity tests which could be applied to the capitation fee for which they asked. The first was the standard of fees paid to a doctor in his private practice. Omitting the exceptional practices where the patients had very small means, the private fees normally received for similar services were fairly comparable with the capitation fee of from 10*s.* 4*d.* to 10*s.* 9*d.*, which they claimed. It must be remembered that in private practice a doctor receives extra payment for many services—e.g., night visits, operations, administration of anæsthetics, which are included in his insurance contract. Another test was the contract service outside the National Insurance Acts. In this class of work there was almost invariably a restricted service, with extra fees for special services, and frequently members were accepted only after medical examination; yet they found that, with few exceptions, the club doctors received a higher capitation fee than the insurance doctor.

There was the further suggested test of the "Time Rate Equivalent." In his opinion they were, on this matter, still groping after the full facts; he thought that both the Ministry and the profession had been wrong in the time equivalence tests which they had sought to apply in 1920. It seemed to him impossible to apply the time factor to the profession. The doctor's work involved constant application and absorption. He had to apply the whole of his professional knowledge to what he did. They strongly objected to the suggestion that it could be said that certain services required only a certain number of hours out of the 24, and that the payment should be based on such calculations. In the interests of national health it was necessary to allow a measure of spare time; if all doctors were kept fully employed for periods of normal illness there would be no reserve to meet times of epidemic. The Ministry suggested that only one-half of a doctor's time would be occupied in looking after 2000 patients. This involved the conclusion that 8000 doctors fully occupied would be sufficient to carry on the whole general practice of the country. In fact, the number of doctors was two and a half to three times in excess of that figure, and it was absurd to suggest that they were all surplus to requirements.

In conclusion, Dr. Brackenbury said that the amount which the capitation fee would bring to the individual doctor must represent the translation into terms of income of all the services which the doctor was required to render under his agreement with the Insurance Committee. In deciding that amount it was necessary to have regard to the present cost of living, to the extensive character of the services which were involved, and to the need for maintaining a high standard of professional efficiency in the National Insurance Service.

In reply to questions addressed by members of the Court, Dr. Brackenbury stated that the average private fees might be taken as 3*s.* 6*d.* for a consultation and 5*s.* for a visit; sometimes they were 2*s.* 6*d.* and 3*s.* 6*d.* respectively, and frequently they were higher than the average. In any case it was customary to charge special fees for some services such as fractures or dislocations, which were included under the normal insurance agreement. A doctor with 2000 patients on his list could not do justice to his patients unless he employed some clerical assistance. It was difficult to give any average figure of the number of patients a doctor could visit in the course of a day; it depended largely on the nature of the practice. He agreed that a doctor should be able to give adequate treatment to 25 patients a day in an average practice.

Figures Supporting the Doctors' Claims.

Dr. Cox presented figures in support of the doctors' case. He said that the British Medical Association has experienced great difficulty in obtaining statistics from its members; it had to extract them by something approaching violence. Reducing private fees to a capitation fee equivalent, and assuming 3·8 services per insured person per annum, the returns from 13 areas showed that in only two cases was the fee below 10*s.* 6*d.*; the maximum was 14*s.* 9*d.*, and the minimum 8*s.* 7*d.* Regarding contract rates outside the insurance scheme, the figures for 40 public medical services showed that in 18 an annual fee of 13*s.* was charged for treatment and medicine; in the remaining 22 the fee varied from 20*s.* to 6*s.* 6*d.*, the latter figure referring to patients with an income limit of 21*s.* a week. There was usually an entrance fee, and special fees were charged for vaccinations, expensive medicines, and special services like fractures, dislocations, operations with anæsthetic, miscarriages, &c. As regards private contract arrangements made by individual doctors, the income limit was often £150, the patients were selected, and the services restricted. The fees varied considerably. Out of 55 cases from all parts of the country, the adult capitation rate varied from 7*s.* to 18*s.*; only seven were under 10*s.* In 13 contract arrangements made exclusively for the police, the rate varied from 11*s.* to 20*s.* The contract rate in respect of Post Office employees had been varied to accord with the National Insurance capitation rate, and was 11*s.* 6*d.* including medicines. For the colliery districts, where contract practice was common, the weekly rate worked out at a capitation fee of 9*s.* 7*d.* in Scotland and 7*s.* 8*d.* in England.

Points from Statistics.

Prof. A. L. Bowley explained some points arising out of the statistical evidence of the doctors' case. In working out the figures for the 1920 arbitration he had taken account of the special circumstances existing—for example, the scarcity of certain food-supplies, the high prices, and the inelasticity of professional incomes, and he had accordingly assumed a considerable economy in the individual doctor's budget. In 1923 there was not the same need for economy, in the national sense, and the reasons for writing down the cost of living in 1920 were no longer all applicable. This explained why the 1920 and 1923 computations did not fit closely into each other. The broad result of his calculations was that the doctor's expenses for 1923 were nearly equal to that for 1920.

Mr. M. L. Gwyer, solicitor to the Ministry of Health, suggested that it would be helpful if figures could be prepared for 1920 and 1923 computed on the same basis.

Support from the Medical Practitioners' Union.

Dr. Gordon R. Ward made a statement in support of the case submitted on behalf of the Medical Practitioners' Union. He said that in the opinion of his union it was most important that regard should be had to the quality as well as to the quantity of medical practitioners engaged in insurance practice. There had been a falling-off in doctors' incomes derived from their private practices; this was due to a variety of causes, such as the financial stringency of the middle classes, the raising to £250 of the income limit under the Insurance Acts, the increase of clinics and of hospital treatment, and the general improvement in public health. He suggested that it was a time when the remuneration from insurance practice should be increased rather than reduced. A higher rate of remuneration was also demanded by the increased range and complexity of the services required from insurance practitioners. As instances of the additional work and responsibility which the insurance doctor had to shoulder, Dr. Ward noted the increased services to hospital patients, prophylactic treatment, the treatment of allergic disease, insulin, and psychotherapy. Further, there were the grave and burdensome conditions under which the insurance doctors were obliged to accept service, including an elaborate penal code. In reply to the Chairman, Dr. Ward stated that in his opinion the average daily number of visits paid by a doctor was about 12; for his own district (Sevenoaks) it was 11·5–14.

The Case for the Ministry of Health.

Mr. Gwyer, in presenting the case on behalf of the Ministry and the Secretary for Scotland, stated that the Department, too, had approached the question impartially. They had not sought to find the cheapest rate for which they could get an insurance medical service. The capitation fee put forward by the Ministry represented, in their opinion, one for which a good average service was likely to be obtained. The Minister proposed to offer no evidence as to the quality of the service which had been given in the past. While reserving the right to call rebutting evidence at a later stage, if necessary, they accepted the past service as efficient, although, perhaps, capable of improvement.

A strictly scientific method of determining the doctors' rate of payment was probably impossible to find; one could only try several methods, and if approximately similar results were obtained those results were probably correct. All the Ministry's tests had resulted in a figure of approximately 8*s*. 6*d*. While the Ministry did not suggest that the Civil Service bonus figures were entirely comparable with the doctors' remuneration, they regarded them as being reasonably comparable for the purpose of showing the relative increase and decrease; the Ministry had used these figures only as an analogous ratio of reduction. With reference to the Time-rate Equivalent, the Ministry had arrived at the conclusion that the value of the insurance work of a doctor may be regarded as being roughly one-half of his practice. This did not mean that he necessarily earned as much from private practice as from insurance practice, but the Ministry suggested that it was a reasonable assumption that he could do so if other patients were available and were ready to go to him. The department had undertaken a careful examination of the advertisements which had appeared in certain medical papers offering medical practices for sale, and it had been found that there was a singular relation between the number of insured persons on the doctor's list and the income stated to be derived from the practice. In a large number of cases it was £1 per insurance patient; sometimes it was 30*s*. or even £2. The minimum fee in many cases was stated to be 2*s*. 6*d*.

At this stage the Court adjourned, the Chairman announcing that the Court would sit on the 21st to consider the evidence of the approved societies.

MONDAY, JAN. 7TH.

When the Court reassembled on the 7th, Sir Thomas Neill stated that the approved societies would prepare their case by the 19th. Mr. Gwyer, continuing the presentation of the Ministry's case, stated that approximately 50 per cent. of insurance doctors had under 900 insured persons on their list. Reverting to the Time-rate Equivalent, it must be understood that the capitation fee was a method of remuneration for part-time only; no doctor was occupied only with insurance practice. For the purpose of converting the fee into its time equivalent it was, however, necessary to consider how much of the doctor's time was taken up by a given amount of insurance work. Although this could not be gauged with scientific accuracy, the Ministry's calculations had been made with great care from actual records kept by doctors whose panel patients totalled three-quarters of a million. If it were not possible for a doctor to give adequate treatment to more than 25 patients a day, as had been suggested, it was difficult to understand the figures which appeared in the sale advertisements of practices where the number of insurance patients alone was not infrequently stated to be 3000, while the gross income of the practices was in all cases at least double the income derived from panel patients. A capitation fee of 8*s*. 6*d*. represented a fee of 2*s*. 5*d*. per service rendered; taking into account that this excluded the cost of medicines, cost of collection, or loss through bad debts it was practically equivalent to a fee of 3*s*. in private practice. The doctors' case made a comparison between the figures for 1913, 1920, and 1923, but it was not stated that the main increase in the doctors' work and responsibility since 1913 had resulted from the 1920 Regulations, and had, therefore, existed at the time of the 1920 arbitration, when the profession had agreed to the reduced capitation fee. The range of service had, since 1920, only been extended as regards the administration of anæsthetics. As regards the references in the doctors' case to the increase in the forms of certificate, two of the additional certificates had been asked for by the doctors themselves as tending to relieve them of work, and for a third they might demand extra payment.

The Time-rate Equivalent.

Dr. J. Smith Whitaker, a senior medical officer to the Ministry, gave evidence as to the time-rate equivalent. This method, he said, was first mentioned in a document issued in October, 1919, by the British Medical Association, and in 1920 a considerable part of the doctors' argument had proceeded on that basis. The Ministry had felt that it was necessary to relate the capitation rate to something which was commonly understood, and the test of time-rate payment was of this nature. The Department did not concern themselves with what the doctor might do in the time not devoted to insurance practice, but they were entitled to calculate the time occupied by the work for which the doctor received payment out of the Insurance Funds. It was said that the method of investigating the time equivalent and the accuracy of the records on which the calculations were based were imperfect; but very great care had been taken in this matter. The Regional Medical Officers had received very full instructions, and only the statistics of those doctors who were known to keep careful records had been taken; even so, the Ministry had rejected any records which showed an exceptionally low rate of attendances. The records were examined for towns and practices of all sizes, and, before coming to their final decision, the Ministry had the assistance of the Government Actuary's Department. Having regard to the fact that this investigation had established the figure of 3·5 services per insured person per annum, he submitted that the Court should not accept a higher figure unless it could be substantiated by equal evidence. Statistics showed that 50 per cent. of the insured population pass through the doctors' hands every year, but only from 25 per cent. to 30 per cent. of these made sickness benefit claims; in other words, only one-half of the patients attending a doctor needed certificates. The figures in the Manchester and Salford districts (where the insurance doctors were paid on an attendance basis) showed that only 0·5 per cent.—1 in 200—of the services rendered were "special" services, such as night visits, minor operations, fractures, or dislocations. He considered that a doctor could do all the work arising in connexion with an insurance list of 2000 and yet give an equal amount of time to other professional work without overworking himself. He would regard a doctor's whole time as 2400 hours a year—i.e., eight hours on 300 days a year. Two thousand patients would require about 24 services a working day; of these services eight would be visits and 16 would be consultations. A capitation fee of 7*s*. 9*d*. was at the rate of a net income in the neighbourhood of £1200 for whole-time work, a fee of 8*s*. 6*d*. would give £1330, while 10*s*. 6*d*. would give a net income of £1640.

In reply to questions by the Chairman, Dr. Smith Whitaker said that in his opinion about ten patients could be seen at the surgery in the course of an hour and in urban areas three or four visits an hour could be paid. He thought that, broadly speaking, 48 services a day, giving ten minutes for each, was a fair estimate, and that £665 represented a fair remuneration for half of the doctor's time. It was true that the Manchester and Salford figures showed 4·35 services per patient per annum, but it must be remembered that the remuneration was there reckoned on an attendance basis.

The Chairman expressed doubt whether 10 consultations per hour, or 48 services a day, allowed sufficient time to the doctor.

Dr. H. J. Neilson, a Divisional Medical Officer of the Ministry, gave evidence as to his experience of insurance practice in Nottingham from 1913 to 1915. He had worked with a partner and four assistants and the total panel of insurance patients numbered from 7000 to 8000; in addition he did more private work than insurance work. His experience was that even a doctor working comparatively slowly could manage eight visits and 16 consultations in half his time. Only about 25 per cent. of the cases treated were new cases. He worked about seven hours a day.

Dr. Brackenbury said that, on the witness's statement, he did not see why six doctors should have been necessary to deal with from 7000 to 8000 insured persons.

In reply to Dr. Ward, the witness admitted, amidst laughter, that he had been known by the nickname of "The Scotch Express."

Dr. B. A. Richmond, Regional Medical Officer of the Ministry, gave similar evidence regarding his practice in Bermondsey from 1900 to 1914. He worked the practice with five partners and there was a list of between 7000 and 8000 insurance patients, in addition to an extensive private practice. In the course of nine and a half hours' work, it had been possible for one doctor to see 40 patients at the surgery and to pay 20 visits; of these about 25 surgery attendances and five visits would relate to insured persons.

Dr. Brackenbury, having elicited the fact that 200 maternity cases were also dealt with in the course of the year, felt a difficulty in understanding how they were fitted in with the other services described by the witness, and he wondered what would happen in such a practice in times of epidemic or other stress.

Statistical Side of the Ministry's Case.

Mr. E. J. Strohmenger, C.B., Accountant-General to the Ministry, in giving evidence on the statistical side of the Ministry's case, said that, had a deduction been made, as was suggested, in respect of the pensions and other rights enjoyed by Civil servants, it would, as regards the material income limits, have made a difference of only ¾*d.* on the capitation fee. He criticised the conclusions drawn by the Insurance Acts Committee from Prof. Bowley's figures. They put the doctor in a relatively much more favourable position in 1924 than in 1920. Taking only two items, clothes and personal expenses, while Prof. Bowley showed the same percentage increase over 1914 for both years, he suggested that the cost of clothes had decreased 30 per cent. and personal expenses had decreased by 15 per cent. since 1920. He could not agree to the conclusion that, in spite of the admitted fall in prices, the cost of living for the doctor had remained practically the same. Even the moderate amendments which he suggested to Prof. Bowley's figures showed a fall approaching 20 per cent. in the expenses for 1923—a fall closely approaching that in the Civil Service bonus scale. If a capitation fee of 11*s.* was fair in 1920, then the figure for 1923 should certainly be no higher than 8*s.* 6*d.*

Sir Gilbert Garnsey stated that the figures for 1920 and 1923 in the doctors' case had now been worked out on the same basis, with the result that 1923 showed a fall of 36 points instead of 7 points as in the figures shown in the doctors' case.

Disciplinary Action.

Mr. L. G. Brock, assistant secretary to the Ministry, said that it had been suggested that the disciplinary control exercised by the Ministry over insurance doctors was so arduous that it should be taken into account in determining the appropriate capitation fee. In fact, during the past four years only five doctors had been removed from the Medical List by the Minister; three others had been allowed to resign; and of three other doctors threatened with removal two had been removed from the Medical Register by the General Medical Council, and one had died; 14 representations for the removal of a doctor had not been upheld; while in five cases a pecuniary penalty only had been inflicted. During the same period, out of 1331 cases dealt with by the Medical Service Subcommittees a pecuniary penalty had been inflicted in only 324 instances. In two exceptional cases the penalty had been £1000 and £500 respectively; otherwise the amounts had been under £100, except in ten cases where that amount had been withheld. No penalty was inflicted until the doctor had been given an opportunity of making representations. The withholding of grant was not a fine or penalty in the ordinary sense of the word; it was the recovery of money which should not have been paid to the doctor because he had not earned it.

The Chairman said that the number of cases against doctors appeared very small having regard to the total number of doctors in insurance practice.

Dr. Brackenbury said that his Committee had not, in any part of their case, objected to the disciplinary control with which Mr. Brock had dealt. Their objection was directed solely to the elaborate certification rules, which had no parallel in private practice.

Club Practice in Scotland.

Mr. J. Jeffrey, secretary to the Scottish Board of Health, gave figures relating to club practices in Scotland. An agreement had been signed in 1919 which applied to the whole mining industry and affected 140,000 to 150,000 workers and 400,000 dependents. The system was that the workers (who were insured under the Insurance Acts) paid a flat rate contribution for the provision of medical treatment to their dependents. The payment was 3½*d.* a week without medicine and 4½*d.* with medicine. Women and children under 16 paid half rates. In the steel and iron industry there was a scheme affecting 8500 workers and 23,000 dependents. The rate here was 4½*d.* a week with medicine, apprentices and boys on low wages paying 1*d.* The average number of dependents covered by each contribution was two and a quarter, and this represented a capitation fee of 7*s.* 1*d.* with medicine or 5*s.* 6*d.* without medicine.

The Court adjourned until 11 A.M. on the 8th.

The King has sent a contribution of £100 to the funds of the Mental After Care Association for Poor Persons convalescent or recovered from Institutions for the Insane, Church House, Dean's Yard, Westminster, London, S.W.

DUBLIN NATIONAL CHILDREN'S HOSPITAL.—The board of the National Children's Hospital, Dublin, has speedily taken steps to organise a staff for the hospital, after the regretted death of Sir Lambert H. Ormsby. Mr. Trevor N. Smith, who had for some time acted as physician to the extern department, is confirmed in that post. Dr. G. E. Nesbitt is appointed visiting physician, and Sir W. Taylor and Sir W. I. de C. Wheeler have been invited to accept the duties of visiting surgeons.

ROYAL INFIRMARY, GLASGOW.—The annual meeting of the managers and nursing staff was held on New Year's day, and was attended by representatives of the other hospitals and of the civic authority. Mr. M. W. Montgomery, the Lord Provost, in his opening address referred to the baronetcy recently conferred upon Sir Donald MacAlister. He spoke warmly of the high standard of proficiency to which professional nursing had attained. Mr. James Macfarlane, chairman of managers, also thanked the nursing staff for their help, and announced that arrangements had been made for extending the quarters available for their accommodation. He referred to the treatment of diabetes in the institution with material manufactured in the laboratory of Prof. Noël Paton, and stated that he foresaw the addition of a biochemical laboratory to the infirmary, to control this treatment and to investigate other similar problems. The financial situation was outlined by Mr. T. Warren. The ordinary income had increased during the year from £80,964 to £82,827, and if legacies and special contributions were added the total became £115,251. On the year's working they had been able to place to their capital account £6212. He noted that receipts had increased from £48,564 in 1899, to £151,910 in 1923. A final sum of £30,000 was to be received shortly from the trustees of Miss Schaw.

Correspondence.

"Audi alteram partem."

INSULIN IN THE TROPICS.

To the Editor of THE LANCET.

SIR,—Statements have appeared recently in the press that insulin is unstable in the tropics and has been found to have lost activity on arrival in India. Experiments have been carried out which show that the reports to the effect that insulin is not resistant to tropical climatic conditions should be accepted with considerable reservation so far as "A.B." insulin is concerned. A sample from a batch of "A.B." insulin was heated to a temperature of 95° F. for a month, the activity being carefully determined both before and after the treatment. The result of this careful test showed that insulin "A.B." brand had retained its activity without any detectable loss.

Further testimony to the stability of "A.B." brand insulin is afforded by the following facts. We have had returned to us from India two bottles of our insulin "A.B." brand. This insulin was part of a batch which had been reported as having lost activity in India. We have had the contents of one of the bottles re-tested here, utilising for this purpose a bottle which arrived back in a half-empty condition, as we considered that this would be the most stringent test. The figures obtained showed with remarkable agreement that the activity was exactly the same as when the batch was first issued, two and a half months previously, in spite of the fact that this insulin was sent out without any precautions as to cold storage during its journey to and from India, nor, so far as we are aware, was kept in cold storage while in India.

An interesting fact which may throw some light upon the reports of loss of activity in India is that contents of the same bottle when tested in India did not reduce the blood-sugar of the rabbits to anything like the same extent as we found it to do here before and after going to India. Four times the amount which reduced the blood-sugar to the limit (i.e., 0·042 per cent.) in England only reduced the blood-sugar to 0·062 in India. None of the rabbits in India went into convulsions, while on one-half the dose our rabbits went into very severe convulsions—one of them, indeed, being so severely convulsed that the life of the rabbit was with difficulty saved. These results suggest the possibility that rabbits in India do not give the identical quantitative reaction observed in temperate climates, owing to climatic conditions, the nature of the food administered, or some such variant. These striking and apparently conclusive tests afford very satisfactory evidence of the stability of "A.B." insulin in the tropics.

We bring the foregoing information to the notice of your readers, in order that the benefits of the insulin treatment may not be unnecessarily withheld from diabetic sufferers in the tropics.

We are, Sir, yours faithfully,

THE BRITISH DRUG HOUSES, LTD.
Jan. 7th, 1924. ALLEN AND HANBURYS, LTD.

CARDIAC DYSPNŒA.

To the Editor of THE LANCET.

SIR,—Permit me to acknowledge the kindly and interesting answer of Dr. Claude Wilson to my rather hastily written letter, a revised proof of which, on account of the holidays, did not reach you in time. The effect of a morphia injection in paroxysmal dyspnœa is so dramatic that we take less note perhaps of its solace in the burden of that more ordinary dyspnœa which to such patients makes night a horror. And the good effects soon become apparent, not only in the immediate relief, but also in a larger field of repair; in a better air entry, increasing flow of urine, steadier rhythm of the heart, and subsiding hepatic and abdominal congestion. It is hard to be sure, but I think that the injection of morphine is more effectual than opium, though for secondary reasons one may occasionally prefer opium—e.g., in the form of Dover's powder. Opium is more apt to foul the tongue and to constipate the bowels. I agree that omnipon appears more expedient than opium. Paroxysmal renal dyspnœa, as in primary contracted kidney, is so terrible a fight that one cannot refrain from injection of morphia, though I suppose we use it at greater risk. Happily in this way I have met with no mischance. And when with "cardiac kidney" uræmic symptoms appear, the injection may be used with confidence. It is surprising to see how with the cardiac relief these consequential uræmic states clear up, and the kidneys return to their natural use.

Before closing, may I plead with Dr. Wilson for precision in the use of our terms, and protest against the use in science of colloquial phrases, or at any rate against contentment with them. The term "cardiac asthma" is to be deprecated for many reasons. It is very misleading, especially to the student who is led to confuse two opposite attitudes of the thorax. In asthma the respiration is held in arrest, in cardiac dyspnœa it is violently active. A few days ago Lord Crewe protested against the English lack of precision in language, and against the defence that such and such a phrase is in common use and so cannot be resisted. In business affairs, he said, we may be satisfied with a "thereabouts," but not in science or letters; that we need more of the Greek and French "esprit de précision," more care for definition. In common conversation we may be forgiven if we call a whale a fish; but we should be surprised to see such laxities in a scientific journal.

I am, Sir, yours faithfully,

Cambridge, Jan. 6th, 1924. CLIFFORD ALLBUTT.

ON SOME USES OF DIGITALIS.

To the Editor of THE LANCET.

SIR,—I am very desirous not to misconstrue Dr. G. A. Sutherland and would therefore quote again from him: "I am one of those humble unbelievers who has hitherto failed to find *any* drug, which will act directly and beneficially on the cardiac power of contraction" (italics mine). I now learn from his letter in the Jan. 5th issue of THE LANCET that he uses the word *directly* in the strict pharmacological sense of immediate contact action, thus excluding action through the nerves, whereas I was using it in the common dictionary sense of an uninterrupted sequence of cause and effect. Had this matter been clear to me I should not, of course, have instanced the use of ammonia when applied to the nostrils, and I withdraw it therefore. But now, having accepted his pharmacological definition, what am I to say, when, on my production of a *pharmacological* example of the direct action of ammonia upon the isolated frog-heart, he accepts in one breath, "all the laboratory proof" I want, and in the next blows his acceptance to the winds in the following sentence: "The saddening thing is to see a clinician accepting the results of laboratory experiment as applicable to the treatment of diseased persons, without any attempt to test them carefully at the bedside." Is that a just remark to have made when I had actually prefaced my pharmacological instance by quoting Prof. G. B. Halford's *clinical* experience of the value of the intravenous injection of ammonia in the heart failure (collapse) of snake-bite? Such injection has, until recently, furnished our nearest approach to direct action upon the heart, and this clinical experience was in accord with the pharmacological finding. No, Dr. Sutherland need not mourn on my account, in this respect, for I am fully alive to all the difficulties which beset the transference of laboratory results to clinical medicine, and elsewhere have expressed myself quite clearly on that point. After this remark of his one reads further on with not a little surprise the following words: "No one appreciates the value of pharmacological work in the laboratory more than myself."

I conclude my argument with another piece of clinical work, citing Dr. Bodon's paper (THE LANCET, March 24th, 1923). I cannot go into this now, but would strongly advise all those interested in the subject to consult the original article, which, to my mind, is very convincing. This much, however, I would say here, that did Dr. Bodon's case stand alone it could not be ignored, and that taken together with the other evidence adduced, it makes out the strongest case for immediate intracardiac injection in cases of death from heart failure. I would go further and say that it makes a perhaps stronger case for intracardiac injection to anticipate death, other means having failed. Need one say that a great harvest of successes will not be expected from this method when thus applied to those who are *in extremis* through disease; in the case of sudden death from accident or in the course of an operation, where the vital powers are unexhausted, the method should promise much more.

To conclude, I am sorry that Dr. Sutherland finds my closing remarks provocative and I hope he will accept my assurance that they were not intended to be personal, but to apply rather to the general attitude adopted by a modern school of cardiologists, no doubt quite sincerely: I refer to the question of the advances made in the clinical use of digitalis. What I have said amounts to this, that in my opinion the rules laid down by Dr. George Balfour for the clinical administration of digitalis, some 50 years ago, have not been appreciably advanced since. Dr. Sutherland outdoes me and goes even further back—namely, to Dr. Withering, as the "father of digitalis therapy," and he quotes in evidence a fine piece of observation of the latter, which, by the way, is also quoted by Dr. Balfour. Dr. Withering, therefore, has had his reward; but no one would say that between that date 1785 and the date of Dr. Balfour's teaching, the use of digitalis had not made great advances in selection of case and precision of dosage. Why in Withering's day the differentiation of the dropsies into cardiac and renal had not even been made. But to praise the past does not mean to belittle the present, and for Sir James Mackenzie's labours and achievements I have the highest admiration, even though I be not able everywhere to follow his conclusions.

I am Sir, yours faithfully,

Jan. 7th, 1924. HARRINGTON SAINSBURY.

ON THE HUMANITY OF METHODS OF SLAUGHTER.

To the Editor of THE LANCET.

SIR,—I think most medical men will agree with Dr. Leonard Hill (THE LANCET, Dec. 22nd, 1923, p. 1382) that practically no pain is caused by the throat cutting of animals if both carotids are at once severed as in the Jewish method. I trust, however, that discussion is not to be side-tracked on the advantage or disadvantage of the Jewish method, as no doubt, whatever the result of the discussion may be, the Jewish method will continue to be used by Jews and will not be adopted by English butchers.

To my mind, what calls for immediate reform is the common method of slaughter of oxen by the pole-axe. Dr. Hill rightly states that "the pole-axe is not a certain method in the case of restive animals and in the hands of inexperienced slaughterers." May I go further and say that it is not a certain method in the hands of the most experienced, mis-hits even with them being not infrequent, with resultant intense pain to the animal which often bellows in agony. I strongly advise medical officers of health to concentrate on the immediate abolition of the pole-axe. In Brighton the free bullet has been used in the slaughter of over 3000 beasts since the new by-laws were introduced, and we have had no approach to an accident and no complaint as to the keeping properties of the meat.

I write because I see before us a long discussion on the Jewish methods of slaughter, and the effect of the various methods of slaughter on the keeping properties of meat. However interesting and valuable these discussions may be, they should not delay the immediate adoption of by-laws forbidding the use of the pole-axe. Our first duty is to prevent unnecessary suffering, and this admittedly will occur from time to time and in revolting fashion so long as the pole-axe is in use.

I am, Sir, yours faithfully,

DUNCAN FORBES,

Jan. 3rd, 1924. Medical Officer of Health, Brighton.

THE BONE MARROW AFTER EXPERIMENTAL SPLENECTOMY.

To the Editor of THE LANCET.

SIR,—Apropos of the changes in the bone marrow of normal animals after splenectomy, a subject annotated in your issue of Dec. 8th, 1923 (p. 1254), permit me to state that observations begun by Dr. J. H. Musser and myself shortly after the termination of the war [1] lessen the differences between Dr. Johnstone's conclusions and those reported by Drs. Pearce, Frazier, and myself in our work on the spleen and anæmia. This portion of our spleen work, by the way, was done by Drs. Pearce and Pepper and was first reported separately.[2]

In regard to the facts observed, the earlier work on dogs showed slight changes in the bone marrow of seven dogs between the twenty-fourth and eighty-fourth days after splenectomy, then no observations four and five months after splenectomy and more marked changes from six to 32 months after splenectomy. In our later observations on monkeys (which were controlled in some instances by preliminary and intercurrent biopsies on the femoral bone marrow of the splenectomised animals and nodectomies, &c., on the controls), marked cellular hyperplasia was found four and a half and five months after splenectomy (though it had been absent before splenectomy) and slight two and a half months after; and in two other animals was found to be still marked at 24 and 27 months after splenectomy. The difference, then, between Dr. Johnstone's and our findings is chiefly a matter of degree. He found "an increased production of red blood cells clearly observable on the average, within four weeks after splenectomy, which gradually increases to the maximum about the end of the twelfth week." We found slight cellular hyperplasia beginning in dogs about the same time, and most marked in the only two monkeys examined near the time of his maximum increase. We also were able to extend the period in which hyperplasia is known to exist to more than two years. When the different conditions of the experiments are taken into account (different species of animals, rib v. femoral marrow, &c.), it is perhaps surprising that even greater differences were not encountered.

In regard to the conclusions to be drawn, I should now be inclined to agree with Dr. Johnstone that "the marrow which follows splenectomy is probably secondary and compensatory to the anæmia which follows removal of the normal spleen," although it must always be borne in mind that increased cellular content of the bone marrow does not necessarily mean increased hæmopoiesis. Also bone-marrow studies are always necessarily incomplete (unless all the bones of the body are studied), because it is often possible to get a marked hyperplasia in the marrow of one bone and none in an adjacent bone—e.g., femur and tibia—or much less even in another part of the same bone. We have always, therefore, used the upper third of the femur as a basis for bone-marrow studies and would recommend that some such standard site be used by all bone-marrow investigators. The reason for the persistence of the cellular hyperplasia remains to be

[1] Arch. of Int. Med., 1923, xxxi., 686.
[2] Jour. of Exp. Med., 1914, xx., 19.

explained. If it is "an expression of the law of regeneration in excess," then there should be a correspondingly increased amount of blood destruction, detectable by quantitative urobilin estimations, which, as far as I know, has never been demonstrated. More probable seem earlier explanations of ours that it is partly at least due to non-hæmopoietic cells, concerned with the functions of the missing spleen, such as the breaking up of effete erythrocytes and utilisation of their products.

The complex problems of splenic functions have seemed to some recent writers to be so hopelessly obscure, that I have ventured to attempt to explain discrepancies that are more apparent than real. In the same way, an apparently adequate explanation has been offered, in the article in the *Archives of Internal Medicine* previously referred to, of the apparently contradictory blood pictures found by different investigators after splenectomy.

I am, Sir, yours faithfully,

EDWARD B. KRUMBHAAR, M.D.,
Director of Laboratories.

Philadelphia General Hospital, Dec. 20th, 1923.

GASTRIC ULCERATION.

To the Editor of THE LANCET.

SIR,—I read with regret the leading article under the above heading which appeared in your columns on Dec. 29th last. With regret, because, in my opinion, the article contains statements which cannot be substantiated upon critical examination, and because the article as a whole tends to convey a false impression of the present-day position of the therapeutics of simple ulcer of the stomach and duodenum.

It is usual, in discussions where the opinion of surgeons and physicians is divided, for the former to contrast their best results with those which follow the average, or less careful, forms of medical treatment; physicians, on the other hand, will tend to overemphasise the disastrous consequences of incompetent surgery. From your columns we have reason to expect a more judicious examination of any such problem. But on what authority do you state that "it is without exaggeration to say that the medical mortality from perforation and hæmorrhage is vastly greater than that incidental to surgery, which in a very high percentage of patients leads to a permanent cure"? To describe the deaths which follow perforation and hæmorrhage as a "medical mortality" is quite unjustified. A large series of post-mortem records which I have recently examined discloses the facts that (1) many of such deaths occur in patients who have had neither symptoms nor treatment of any kind before the final catastrophe; (2) that in not a few of these cases perforation or hæmorrhage had occurred subsequent to surgical treatment. Are such to be included in the "medical mortality"?

In the same series it was brought out that the deaths from shock or complications, occurring as the direct result of surgical intervention, whilst considerably less numerous than those following perforation, were far more frequent than those due to hæmorrhage. Where, then, lies your justification for saying that the "medical mortality" is "vastly greater"? Is such a statement "without exaggeration"? It is well to quote Sir Berkeley Moynihan's magnificant series of cases, in which there has been no operative death for many years, but it is perhaps injudicious to do so without emphasising the important fact that this series is a tribute not only to the skilful technique of that distinguished surgeon, but even more to the care with which he has selected those patients well able to withstand the shock of operation. All who have studied the question carefully are agreed that when gastrectomy is performed with less discrimination, when those cases with large ulcers attached to the pancreas or liver are not treated by jejunostomy, the operative mortality is a formidable one. So long as surgeons confine their main attention to the less serious degrees of ulceration their results must tend to be satisfactory; when, on the other hand, extensive forms of the disease are treated radically the result is very different from what the readers of your leading article are led to imagine.

The references to medical treatment in this article are, I believe, equally unfair. Physicians do display a certain hesitancy in "withdrawing the curtain of the abdominal wall" whenever they wish for precise information as to the progress of a patient; but even surgeons are inclined to accept the evidence of the X rays and of the patient himself when once their operation is performed and all is going well; and, if such standards are to be accepted in either case the experience of those physicians who have given special attention to these patients is again very different from what is suggested in your article. In March, 1922, I had occasion to summarise my views on the treatment of gastric ulcer, the subject having been recently debated by a joint meeting of physicians and surgeons at the Royal Society of Medicine. I suggested that the correct attitude of the physician or general practitioner when confronted by a case of gastric ulcer should be as follows:—

1. To treat immediately all sources of sepsis in the mouth and naso-pharynx.
2. To select without delay the cases in which surgery is indicated. These include: (*a*) all cases with chronic pyloric obstruction; (*b*) all cases which have relapsed after a course of thorough medical treatment; (*c*) all cases with a history extending over many years; (*d*) all cases with large ulcers adherent to surrounding structures, and practically all cases in which a test-meal is retained in the stomach for more than six hours; (*e*) all cases where economic position makes prolonged medical treatment impossible.
3. To treat the remaining cases medically, the main lines of treatment being: (*a*) to secure physiological rest for the stomach; (*b*) to neutralise hyperacidity; (*c*) to continue treatment for a sufficient time to procure genuine firm healing; (*d*) to protect the patient against relapse.

I believe that this opinion, to which I adhere to-day, contains no bias against the expert abdominal surgeon; and the fact that it received strongly expressed approval from Dr. W. J. Mayo, of Rochester, U.S.A., confirms me in this belief. But I would add that if my opinion has had any tendency to increase the incidence of reckless abdominal operations, as I feel your leading article may do, then I would have done better not to have written it. It is surely not right that the same journal which has published Dr. E. I. Spriggs's account of "Sixty-five cases seeking relief after short-circuiting operations" should now imply that gastric surgery has reached a position wherein failure is almost unknown; nor can I harmonise the general impression conveyed by your present article with the conclusions expressed by such authorities as Dr. N. A. Nielson or Prof. Knud Faber, of Copenhagen, which were published in your columns, or commented on with approval, within the last 12 months.

Granted that surgery can cure many cases where purely medical treatment has failed, and that in other cases cure may follow surgical treatment rapidly, whilst medical treatment is laborious, I am bound by my experience to emphasise that the death-rate after major operations on the stomach remains a serious one, and that there is an equally serious percentage of cases in whom surgery has not led to permanent cure. The withdrawal of the "curtain of the abdominal wall" is often the prelude to legitimate drama, but in an appreciable number of cases to tragedy of the grimmest description.—I am, Sir, yours faithfully,

Devonshire-place, W., Jan. 7th, 1924. T. IZOD BENNETT.

To the Editor of THE LANCET.

SIR,—With reference to the leading article on this subject in your issue of Dec. 29th last, one could not emphasise too strongly the dangers of such a clear cut statement as: "Surgery seems definitely to have established itself as the only effective treatment for gastric ulcer." If the problem was so easy to solve, much discussion might have been spared to members of the profession who are daily made more uncertain by the contradictory opinions expressed by experts of

high standing. It is true that medical treatment can cure many patients at the expense of iron discipline and also that it fails in a debatable number of cases to prevent hæmorrhages, perforation, stenosis, and cancer. But it is equally sure that surgery entails an added immediate and remote death possibility and is unable in another percentage of cases either to cure or avert recurrence.

Surgery further decisively aggravates a few cases and rarely creates a fearful danger—namely, gastro-jejunal ulcer. This disaster certainly occurs in less than 5 per cent. of operated cases, and those who have not had the misfortune of witnessing the sad plight of one of these patients should read descriptions such as given by Erdmann (American Annals of Surgery, vol. lxxiii., pp. 436–39) or of the hundreds widespread in the Austro-German literature. I believe that any doctor afflicted with recent peptic ulcer would then hesitate to entrust his life even to one of those exceptionally highly specialised surgeons until medical treatment had been intelligently tried. A well-known surgeon, who suffered from duodenal ulcer, was operated on by a French professor who will leave a name for his research on lymphatics of the stomach. Simple gastro-enterostomy was performed and jejunal ulcer appeared in a few months. The most experienced operator in Europe then resected the diseased stoma, performing an extensive gastrectomy terminated by a polya, in barely few weeks a fresh marginal ulcer appeared with fatal results!

Cases of this kind are not unique. There is not even the slightest consensus of opinion between operators like Moynihan, Pauchet, Haberer, Kümmell, W. Mayo, Balfour as to the wisest operative processes. While some of these advocate gastrectomy, others are conservative, and two who strongly recommended excision ten years ago now reject it. This suggests that matters are not so smooth as some surgeons would make us believe. It is difficult to admit that extensive systematic gastrectomy upon unselected cases including men above 50 and adherent ulcers of the lesser curvature will ever be performed with a death-rate under 5 per cent. or more.

Extensive gastrectomy with its higher primary mortality does not even confer those guarantees from jejunal ulcer expected by some masters; more than eight cases have been reported in the German literature and I know of several others. It is admitted, on the other hand, that from 25 per cent. to 10 per cent. (Balfour) of gastro-enterostomies are failures, and this means that a cruel infirmity then aggravates an already difficult position. If the claims of some in favour of this operation are justified, how is it that surgeons like Flint (THE LANCET, Sept. 8th, 1923, p. 508) defend gastro-duodenostomy, which is condemned in turn by others? Is it even well proved that surgeons have the opportunity of following over many years such a majority of their patients as to estimate beyond dispute their own methods? In THE LANCET of Dec. 22nd Walton describes a dyspeptic syndrome of young women, accompanied possibly by sharp hæmatemesis without appreciable organic lesions. Now if operative interference is blindly undertaken on the suspicion of recent ulcers, is it not at the risk of sad mistakes?

Finally, the argument of the unavoidable diet against medical treatment is unintelligible because dietetic restriction is quite as compulsory after any type of operation. It is not reasonably possible to attack the principle of surgery when it attempts to deal with incurable peptic ulcer, but a return to its indiscriminate use as soon as a case is diagnosed with mere probability cannot resist searching criticism based upon facts.—I am, Sir, yours faithfully,

Paris, Jan. 2nd, 1924. Dr. E. V. MISRACHI.

*** The gastric ulcer for which surgery and surgery alone claims to be effective is the chronic ulcer, and although this was implied in our article it might have been stated more explicitly. Dr. Izod Bennett's selection of cases in which surgery is indicated defines the common ground between two branches of the medical profession. On each side there are disputed territories.—ED. L.

Obituary.

SIR JOHN TWEEDY.

THE whole of the medical profession will have learned with regret of the sudden death on Friday last, Jan. 4th, of Sir John Tweedy, while all the senior members of the staff of THE LANCET have reasons for feeling the occurrence as a personal loss.

Sir John Tweedy was the son of Mr. John Tweedy, of Stockton-on-Tees, where he was born in 1849. He was educated at Elmfield, York, and University College, London, proceeding from the College to the hospital, on whose staff at the time the notable figures were the great Sharpey, William Jenner, John Erichsen, Sydney Ringer, Charlton Bastian, Walshe, Russell Reynolds, and Henry Thompson, while many of his contemporaries succeeded to places on the staff. He took the diplomas of the Royal Colleges in 1872, proceeding to the F.R.C.S. some four years later, and from the first showed the direction which his scientific work would take, for in 1871 he published in

SIR JOHN TWEEDY.

these columns a note on Stellation of the Normal and the Cataractous Crystalline Lens. A sequel to this paper, published in 1874, was accompanied with drawings representing enlarged views of the stellate lines on the front of the lenses in one of the cases, and attracted a good deal of attention.

His professional experiences from the beginning were roughly divided into two, the first rising from the intensive study of ophthalmology at the Royal London Ophthalmic Hospital at Moorfields, and the second from his appointment as editor of THE LANCET "Mirror of Hospital Practice." He maintained his connexion with University College Hospital by holding the post of assistant dermatologist, and the clinical experience thus gained was published as a section on diseases of the skin in the earlier editions of Roberts's Text-book on Medicine. But at Moorfields he used to the full his great opportunities of becoming a leading ophthalmologist. He followed his early publications with other useful and practical papers dealing with the physiology and anatomy as well as the surgery and therapeutics of diseases of the eye, and even before his appointment in 1879 as assistant

surgeon to Moorfields he had established considerable private reputation. He was appointed ophthalmic surgeon to that hospital and to the Great Northern Hospital in the same year, 1878, and in the ensuing period contributed largely to Heath's Dictionary of Practical Surgery, where he wrote the articles "Cornea" and "Sclerotic," and Quain's Dictionary of Medicine, where he wrote, among others, the articles "Hemeralopia" and "Nyctalopia." Clinical articles appeared in THE LANCET and elsewhere on operative procedure and the employment of various drugs, and he also wrote occasionally on his special subjects in THE LANCET, where, however, Brudenell Carter and Henry Power were senior members of the staff. In 1881 he was appointed assistant ophthalmic surgeon to University College Hospital, his senior being J. F. Streatfield, whom he succeeded as full surgeon in 1888, while other members of the full staff included some of his teachers whose names have been enumerated, and Frederick Roberts, Prof. Thane, Marcus Beck, Vivian Poore, Gowers, and Sir Rickman Godlee. From 1888 until 1904 he was professor of ophthalmology at University College, being also for a large period of the time surgeon to Moorfields.

His early and long connexion with THE LANCET introduced him, at first perhaps not very usefully, to the leaders of the profession at the very beginning of his career, but such was his obvious honesty and fairness that the members of the hospital staffs, who in the 'seventies and 'eighties still resented the attitude of the paper towards their class, were converted largely by him into hearty coöperators, making the weekly account of hospital activities inclusive and valuable. And the general outlook upon surgery which the systematic visiting of all the operating theatres gave him from the very date of his first obtaining qualifications ensured that his attitude towards his specialty should be always of the broadest as well as of the most practical kind; years later he bore witness to this in his Hunterian oration before the Royal College of Surgeons of England, when he insisted that all good specialism must be founded on good general education. During his term of editorship of "The Mirror" he became an intimate friend of Dr. James Wakley who edited THE LANCET between the years of 1862 and 1886, and through the last decade of that period Tweedy not only contributed the weekly résumé of hospital surgery and many articles in which a wide range of classical knowledge was employed, but he was also largely responsible for the utterance of the editorial views on the constitution of the Royal College of Surgeons of England. Consequently it was as a reformer that Tweedy obtained his first seat on the Council of the College, to which he was elected in 1892. His election disclosed among the Fellows of the College an unexpected sympathy with the claims of the Members, as always advocated in THE LANCET, and those who know the history of the movement which was then in existence for forwarding those claims know also that success would probably have attended the wise and conciliatory attitude which was being taken by the protagonists and supported in these columns by Tweedy. How those who wished to move quicker hampered all progress forms no part of any obituary notice of Tweedy, save that the following should be stated. Within the Council he was perfectly prepared to stand by all that he was known to stand by before his election, but he was not willing to be the spokesman of those who desired to take up a different ground. On the Council of the College he soon obtained a prominent position, because it had become clear to his colleagues that he had the story of the constitution at his finger's ends, that his actions were always scrupulously fair, and that he stood in no fear whatever of the arbitrary manners of certain of his seniors, who undoubtedly regarded his election as a protest against themselves. After just over 11 years' service on the Council, Tweedy was elected President of the College not only at the unusual age of 54 but on the first ballot. He served as President for three years, was given the honorary fellowship of the Royal College of Surgeons of Edinburgh, and the degree of LL.D. by the University of Edinburgh in 1905, and in 1906 received the honour of knighthood.

The qualities which had obtained for Tweedy such signal and prompt recognition at the Royal College of Surgeons were exhibited in many other public capacities, for his services were in keen demand wherever organisation and administration were required, it being recognised that he took no post in an honorary or ornamental capacity, but gave always of his best to the furtherance of the objects aimed at. In addition to remaining attached in a consulting capacity to his various hospitals, he was a trustee of the Hunterian Museum, and a member of the Medical Consultative Board of the Navy. He was President of the Ophthalmological Society at the same time that he was President of the Royal College of Surgeons—a unique distinction; he was at different times President of the Medico-Legal Society, of the Medical Defence Union, and of the Royal Medical Benevolent Fund, while he was a member of King Edward's Hospital Fund for London, where he sat on the distribution committee as member, and later as chairman, for 14 years, and brought a first-hand familiarity of London hospital problems to the discussions. He was a trustee and for some time treasurer of the Medical Society of London, a trustee of the London and Counties Medical Protection Society, and a member of the Council of the Imperial Cancer Research Fund. He was a first-class Latin scholar and had a sound knowledge of Greek, and the results of this interest which he took in classical literature he often employed in public utterances, such as the first Thomas Vicary lecture delivered before the Royal College of Surgeons, and the Annual Oration at the Medical Society of London, both of which excellent discourses were published in our columns and displayed the speaker not only as a classicist, but as possessing sound and varied knowledge on medical history. In recognition of this knowledge he was elected Master of the Worshipful Company of Barbers, at the sex-centenary celebration of the Company.

We have said enough to show that in Sir John Tweedy not only the medical profession but the whole of society has lost one whom it could ill afford to spare. He had been in delicate health for some time, but his death must have been unexpected to all save his immediate entourage. At the Centenary Dinner of THE LANCET, save for an increased deafness, he appeared to his friends to be in his usual health, the laboured respiration, whose cause was never discovered and which made strangers think that he was a serious invalid, having been common to him for the greater part of his life.

Sir John Tweedy married Mary, daughter of Mr. Richard Hilhouse, and had two sons and one daughter. Lady Tweedy is widely known to all the medical profession for her indefatigable and successful work in connexion with the Royal Medical Benevolent Fund Guild.

ROGER ALAN BIRDWOOD, M.D. CAMB.

Dr. R. A. Birdwood, late medical superintendent of infectious hospitals under the Metropolitan Asylums Board, London, died on Jan. 2nd, in his seventy-third year. Born in Bombay in 1851, he was one of the younger of the 14 children of General Christopher Birdwood, Deputy Commissary-General of the Bombay Army and sometime Commander of the Poona Brigade. Dr. Birdwood was educated at the Dollar Academy, at the Blackheath School for the Sons of Missionaries (his maternal grandfather being the Rev. Joseph Taylor, of the London Missionary Society), and at King's College, London. Unsuccessful in an effort made, at the minimum age, to gain admission to the I.C.S., he went with a scholarship to Peterhouse, Cambridge, and graduated M.A. He took his M.D. degree from Guy's Hospital, and after a short period of work under the Metropolitan Asylums Board went out to South Africa for service in the Zulu Campaign. There he distinguished himself in medical service and received the medal and clasp. Returning to London,

Dr. Birdwood was appointed house surgeon to the Gravesend Infirmary, and by his energies secured the provision of a separate ward for children. In 1884 the Asylums Board appointed him medical superintendent of the hospital ships. He was an able administrator and a skilled organiser, and in 1892 he accepted the responsibility of planning and furnishing the North-Eastern Fever Hospital at Tottenham, where his experience, combined with his personal qualities, his energy, and his optimism, were the chief factors which welded the institution into an efficient whole. Some years later he was entrusted with a similar task in the Park Fever Hospital at Hither Green. There he remained in charge for 18 years, during which time he carried out its conversion to the children's service, and later its re-conversion for infectious diseases. The Metropolitan Asylums Board often sought his advice and assistance on questions of policy, and it was on his initiative that its hospitals were brought into use for medical instruction. When he retired in 1915 the Board, as a recognition of his exceptional professional services, added five years to his actual period of service for the purpose of computing the superannuation allowance.

An old friend and former colleague at Tottenham Fever Hospital, Dr. F. M. Turner, sends the following appreciation of Dr. Birdwood's work: "He was a man of high ideals both in medicine and other matters. Many of the causes that he took up and of the opinions that he advocated were not popular at the time, but have been since justified by experience or by being later adopted as orthodox doctrine. His advocacy of the policy of sending all small-pox cases out of London to the hospital ships at Dartford was accompanied by the prophecy that we should then get rid of small-pox in London except for fresh importations, a prophecy that has come true. His view that alcohol was a poison and did more harm than good in severe infectious fevers was based on his own observations in small-pox cases. Many a lecture did his junior medical officers receive if they prescribed it. He was not quite consistent, for when he had a patient dying he would himself often order champagne. And if this doctrine is still an unsettled question, the statistics as to the decline in the alcohol prescribed in both the London general hospitals and the fever hospitals, which have been often quoted, show that his views, unorthodox in 1890, are very close to the average medical opinion at the present time. Into the vaccination controversy Birdwood was necessarily drawn. He held that one vaccination mark is quite as good a protection as three or more, and used always to vaccinate in one place only at the small-pox hospital ships. This view is not yet accepted by orthodox authorities, but the M.A.B. statistics show that it is much nearer the truth than the common opinion that two vesicles give twice the protection of one. In politics Birdwood was a Radical and in favour of most progressive movements. He favoured the entry of women into the medical profession, and there were usually women doctors on the staff at Tottenham. He always strove for the right as he saw it, and strove hard."

Touching his personal qualities, a former senior assistant medical officer at the Park Hospital writes of his old chief: "Three of Roger Birdwood's characteristics are green in my memory. His intense personal interest and keenness to help in the work and future career of the men whom he trained, his hatred of conventionality and humbug, and his love for children, animals, and flowers. To Birdwood there was no such thing as 'routine work.' Every apparently unimportant detail was to him a matter of vital importance to the welfare of the hospital which he ruled and loved so well, and much of his day was spent in personal conversation with officials of every grade on the importance of their work and the effect which it had on the welfare of the patients. To his assistant medical officers he was a hard and sometimes irascible taskmaster, but he was also a sympathetic friend and a real inspiration and driving force. He never accepted a view simply because it was popular or in the text-books, and yet he was a far more severe critic of his own opinions than of the other views which he often so scathingly derided. His criticism often hurt for the moment, but it was always followed by a glimpse of the warm heart underneath and was ever constructive. Birdwood was really, though perhaps unconsciously, often in advance of his times. In his criticism, for instance, of the conventional attitude towards the antitoxin treatment of diphtheria, which we A.M.O.'s were apt to regard as an article of faith, he forestalled much of the subsequent work on anaphylaxis, though he was apt to regard the pathological laboratory as a funk-hole in which lazy medical officers used to prolong the after-breakfast pipe. His reputation as an intuitive clinician of rare skill and a born administrator was well known to those who had the privilege of working under him. He was also a well-beloved master and friend."

Dr. Birdwood's only son, Lieutenant H. F. Birdwood, of the Flying Corps, was killed early in 1916 in an air fight over the enemy lines on the Western Front.

JAMES LAMOND LACKIE, M.D., C.M., F.R.C.P. EDIN.

THE death took place during his sleep in the early morning of Jan. 5th of Dr. J. Lamond Lackie, physician to the Royal Maternity and Simpson Memorial Hospital, Edinburgh. Dr. Lackie was 56 years of age and apparently in excellent health. He was cut off in the full vigour of his professional activities.

Dr. Lackie was born at Montrose, where he received his early education. Later he attended the arts classes at Aberdeen University for a short time. In 1885 he came to Edinburgh to commence his medical studies, and, after an exceptionally brilliant career as an undergraduate, he qualified with first-class honours in 1889, when he was awarded the James Scott Prize in obstetrics. It was the gaining of this prize which determined his future career. In 1894 he took his M.D. degree with honours, and in 1896 became a Fellow of the Royal College of Physicians of Edinburgh. After filling several junior hospital appointments in Edinburgh and a short period of general practice in Ventnor as assistant to Dr. J. G. S. Coghill, he returned to Edinburgh as assistant to Sir Halliday Croom. His association with Sir Halliday Croom, for whom he had the greatest admiration, influenced him in many ways, and to that influence no doubt he owed much of his skill and proficiency.

At the time of his death Dr. Lackie held many important appointments. He was one of the senior physicians at the Royal Maternity and Simpson Memorial Hospital, senior gynæcologist in Leith Hospital, and senior gynæcologist in the Hospital for Women at Archibald-place. He was also a valued member of the Council of the Royal College of Physicians, and was examiner in midwifery and gynæcology to the Universities of Edinburgh, Aberdeen, Durham, and St. Andrews. In November last he resigned office as President of the Edinburgh Obstetrical Society, and his presidential address,[1] which discussed the advances in obstetrics and gynæcology in his time, showed the masterly grip he had on his subject and the breadth of his outlook. He was President of the British Gynæcological Congress which met in Edinburgh last year, and the unqualified success of that meeting was in large measure due to his genial personality and the esteem in which he was held by his professional brethren. His practice as an obstetrician and gynæcologist was extensive, and his special knowledge and skill were often sought and always valued by his fellow practitioners. Dr. Lackie inspired confidence, esteem, and affection in all his patients and in all with whom he came in contact. His interests outside his professional life were many, and his tall, commanding presence,

[1] THE LANCET, Nov. 24th, 1923, p. 1158.

his cheery, optimistic personality brought him many friends. He was a keen golfer and curler, and fond of shooting. One might say, briefly, that he was a man widely and deservedly loved.

Dr. Lackie is survived by his wife, son, and daughter, to whom will go out the sympathy of his many friends.

Medical News.

UNIVERSITY OF LONDON.—A Course of Three Advanced Lectures in Hygiene on the Influence of Improved Town Planning and Housing in Public Health will be given at University College, Gower-street, London, W.C., by Prof. John Robertson, at 5 P.M. on Jan. 18th, Feb. 1st, and Feb. 15th. The first lecture will deal with existing conditions which prejudicially influence health in the housing and town planning of English towns, the second lecture with standards of accommodation and of environment which are essential for good health, and the third lecture with the results to be achieved, the question of cost, and the propaganda necessary to obtain the best results. At the first lecture the chair will be taken by Prof. H. R. Kenwood. The lectures, which will be illustrated with lantern slides, are addressed to advanced students of the University and to others interested in the subject. Admission is free, without ticket.

ROYAL SOCIETY OF MEDICINE.—The next social evening will be held on Jan. 16th, at 8.30 P.M., when Fellows, Members of sections, Associates and their friends will be received by the President, Sir William Hale-White, and Lady Hale-White.

Owing to the illness of Dr. Arnold Chaplin, whose lecture had been previously announced, Sir Arthur Keith will give a short lecture, entitled Punch as an Anthropologist, at 9 P.M. It will be illustrated on the epidiascope. The library will be open, and various objects of interest will be shown, including an exhibition of hand-loom silks and pottery.

ROYAL INSTITUTION.—The hour of the afternoon lectures at the Institution has been altered this year from 3 to 5.15 P.M., except on Saturdays when the hour remains 3. This decision will be welcomed by many who have hitherto been unable to attend these interesting lectures. The courses begin on Tuesday next, with the first of two lectures by Prof. W. E. Dixon on Drug Addictions.

CHELSEA CLINICAL SOCIETY.—A meeting will take place at the Club Room, St. George's Hospital (entrance through main doors during rebuilding), on Jan. 15th at 8.30 P.M., when a discussion on the Treatment of Functional Nervous Disorders will be opened by Dr. S. A. Kinnier Wilson.

MEDICO-LEGAL SOCIETY.—A meeting will be held at 11, Chandos-street, Cavendish-square, London, W., on Jan. 15th, at 8.30 P.M., when a paper will be read by Sir Francis Newbolt, K.C., on Evidence of Resemblance in Paternity Cases, which will be followed by a discussion.

GUILD OF PUBLIC PHARMACISTS.—A lecture will be delivered by Mr. E. W. Morris, house governor of the London Hospital, on the Future of Voluntary and Municipal Hospitals, at 17, Bloomsbury-square, on Jan. 16th, at 8 P.M. Dr. H. L. Eason will preside.

MANCHESTER ROYAL INFIRMARY.—The Old Residents' Club will hold a dinner at the Midland Hotel, Manchester, on Feb. 5th. Any old resident who has not received a notice is asked to communicate with the hon. secretaries of the Club, at the Royal Infirmary.

AMERICAN MEDICAL ASSOCIATION: ANNUAL MEETING.—The date of the next annual gathering of this Association has been fixed for June 9th to 13th, 1924. All the sessions will be held on the Municipal Pier at Chicago.

ROYAL MEDICAL BENEVOLENT FUND GUILD.—A concert in aid of this Guild will be given by the Stock Exchange Male Voice Choir on Jan. 22nd, at 8 P.M., at the Wigmore Hall, Wigmore-street, London, W. Further particulars and tickets may be obtained from the Hon. Organiser, Mr. C. Godwin, 25, Austin Friars, E.C. 2.

LONDON NEUROLOGICAL CLINIC.—The sixth annual dinner will be held at Princes' Restaurant, Piccadilly, London, W., on Jan. 26th, at 7 for 7.30 P.M. Tickets 15s. each. The guest of the evening will be Lord Dawson. Past and present members who wish to be present should notify the treasurer, Dr. E. F. Pratt, 15, Clarges-street, W., before Jan. 19th.

ROYAL INSTITUTE OF PUBLIC HEALTH.—A Course of nine lectures on Tuberculosis will be delivered in the Lecture Hall of the Institute, 37, Russell-square, London, W.C. 1, on Wednesdays at 4 P.M., from Jan. 16th to March 12th. Prof. S. Lyle Cummins will give the opening lecture on Tuberculosis: How and When is it an Infective Disease? and the subsequent lecturers will be Dr. G. Lissant Cox, Sir Henry Gauvain, Dr. S. Vere Pearson, Dr. P. C. Varrier-Jones, Dr. Marcus S. Paterson, Dr. A. C. Inman, Dr. B. T. J. Glover, and Dr. G. B. Dixon.

DUBLIN (83) GENERAL HOSPITAL ANNUAL DINNER.—The annual dinner of the members of the Dublin Units who served at 83 (Dublin) General Hospital in France in 1917–18 was held on Jan. 5th, at Mills' Hall, Dublin. Sir William Taylor, who organised the units, presided, and there were about twenty present. The members entertained as guests General R. H. S. Sawyer and Prof. A. Fullerton, who had been D.D.M.S. and consulting surgeon respectively in the Boulogne area when the hospital was working, and Mr. A. Miller, registrar of the Royal College of Surgeons in Ireland.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Jan. 15th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for election to the Fellowship.

PATHOLOGY: at 8.30 P.M.
Communications, &c.:
Mr. R. J. Gunther: Demonstration of a case of Arteriosclerosis in a Crocodile of the Mesozoic Age.
Mr. J. K. Clarke: Bacteriology of Dental Caries.
Mr. A. Fleming: Accuracy of Measurements in Capillary Tubes.

Wednesday, Jan. 16th.

HISTORY OF MEDICINE: at 5 P.M.
Paper:
Lieut.-Colonel H. A. L. Howell, R.A.M.C. (Ret.): Medical Services at the Battle of Waterloo.

WAR.
Members of the War Section are cordially invited to attend the above meeting.

SOCIAL EVENING.
The next Social Evening will be held on Wednesday, Jan. 16th, at 8.30 P.M., when Fellows, Members of Sections, Associates, and their friends will be received by the President, Sir William Hale-White, and Lady Hale-White, at 8.30 P.M.
Owing to the illness of Dr. Arnold Chaplin, whose lecture has been announced on previous notices, Sir Arthur Keith has kindly agreed to give a short lecture in his place, entitled Punch as an Anthropologist, at 9 P.M. It will be illustrated on the epidiascope.
The Library will be open and various objects of interest will be exhibited. Music, light refreshments, and smoking.

LIBRARY.
On this evening the principal Reading Room will be closed at 5 P.M., but readers will be accommodated in other rooms.

Thursday, Jan. 17th.

DERMATOLOGY: at 5 P.M. (Cases at 4 P.M.)

Friday, Jan. 18th.

ELECTRO-THERAPEUTICS: at 8.30 P.M.
Papers:
Dr. C. Beresford Alexander: Electro-therapeutic Methods in the Treatment of Fractures.
Dr. Martin Smart: Injuries to Muscles and Joints and their Treatment by Graduated Contraction.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Jan. 14th.—8 P.M., Pathological Meeting. Specimens. Dr. H. G. Butterfield will give a demonstration of his method and apparatus for micro-photography.

HUNTERIAN SOCIETY.
MONDAY, Jan. 14th.—(At the London Mansion House.) Sir J. Thomson-Walker: Hunterian Oration: Infections of the Urinary Tract due to the *B. coli communis*.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W.
THURSDAY, Jan. 17th.—8.15 P.M. (preceded by a demonstration at 7.45 of Various Dysenteric Conditions) a paper on Local Immunity in Infectious Diseases, by Prof. Besredka, of the Pasteur Institute, Paris, will be read (in English) by his colleague, Dr. Harry Platz.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, W.
TUESDAY, Jan. 15th.—5.15 P.M., Dr. W. E. Dixon: Drug Addictions. (Lecture I.)
FRIDAY.—9 P.M., Prof. H. E. Armstrong: The Scientific Work of Prof. Sir James Dewar.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Jan. 16th.—4 P.M., Prof. S. L. Cummins: Tuberculosis—How and When is it an Infectious Disease?

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Jan. 14th, to FRIDAY, Jan. 18th.—NORTH-EASTERN FEVER HOSPITAL. Wed. and Sat., 11 A.M., Dr. F. Thomson: Diagnosis and Treatment of the Acute Infectious Diseases.—ST. PETER'S HOSPITAL FOR STONE. Mon., 2 P.M., Mr. Andrews: Injuries of the Urinary Organs; Tues., 2 P.M., Mr. Joly: Urinary Calculi and Calculous Disease; Wed., 2 P.M., Mr. Morson: Tumours of the Urinary Tract; Thurs., Mr. F. J. F. Barrington: Non-Tuberculous Infections of the Urinary Tract: Fri., 2 P.M., Sir John Thomson-Walker: Urinary Obstruction (this lecture will be given at the Royal Society of Medicine); Sat., 2 P.M., Mr. Harkness: Urethritis in the Male.—THE INFANTS HOSPITAL. 2 P.M., Clinical Demonstrations each day. Mon., 4 P.M., Dr. Eric Pritchard: Modification of Cow's Milk; Tues., 4 P.M., Dr. Mackay: Therapeutic Effects of Ultra-Violet Ray (illustrated); Wed., 4 P.M., Dr. MacCormac: Diagnosis of Skin Diseases in Infants; Thurs., 4 P.M., Dr. D. Paterson: Convulsions; Fri., 4 P.M., Mr. Tyrrell Gray: Pyloric Stenosis.—WEST END HOSPITAL FOR NERVOUS DISEASES, at 73, Welbeck-street, W. Mon., 2 P.M., Dr. H. Carlill: Practical Points in Everyday Neurology; Tues., 5 P.M., Mr. Laming Evans: Orthopædic Treatment of Nervous Diseases. Thurs., 5 P.M., Dr. Carlill: Tabes Dorsalis; Fri., 1.30 P.M., Sir James Dundas-Grant: Labyrinthine Tests.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Jan. 14th.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Bishop Harman: Eye Dept.
TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Pernet: Skin Dept.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

UNIVERSITY COLLEGE, Gower-street, W.C.
FRIDAY, Jan. 18th.—5 P.M., Prof. J. Robertson: The Influence of Improved Town Planning and Housing in Public Health. (First of three lectures.)

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, Jan. 16th.—4.30 P.M., Mr. C. E. S. Phillips: Electricity in the Service of Medicine.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Jan. 17th.—4 P.M., Dr. Heald: Treatment of Poliomyelitis by Diathermy.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Jan. 15th.—5 P.M., Dr. H. W. Barber: Lupus Erythematosus.
THURSDAY.—Chesterfield Lecture, 5 P.M., Dr. W. Griffith: Eczema.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Jan. 17th.—Dr. C. H. Roberts: Ante-partum Hæmorrhage.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Jan. 14th.—(At the Hospital for Women.) Mr. A. L. Robinson: Genital Prolapse.
TUESDAY.—(At the Maternity Hospital.) Mr. Leith Murray: Ante-partum Hæmorrhage.
WEDNESDAY.—(At the St. Paul's Eye Hospital.) Mr. H. Bywater: Methods of Examination of the Eyes.
THURSDAY.—(At St. George's Skin Hospital.) Dr. F. H. Barendt: Skin Cases.
FRIDAY.—(At the Eye and Ear Infirmary.)

Appointments.

STEELE, R. V., M.B., B.S. Durh., has been appointed Post Office Medical Officer for Camden Town Division (N.W. Head District).

Royal Northern Hospital: GRAHAM, G., M.D. Lond., F.R.C.P. Lond., Physician (with charge of In-patients); BEATTY, C. C., M.B., B.S. Lond., M.R.C.P. Lond., Physician (with charge of Out-patients); MCCOY, H. A., M.B., Ch.M., Assistant Radiologist; ROSE, W. G., M.B., B.S. Lond., Resident Medical Officer; MASON, G. A., M.B., Casualty officer; MACONIE, A. C., M.B., B.S. Lond., and HEMBROW, C. H., M.B., House Surgeons.

Certifying Surgeons under the Factory and Workshop Acts: MACKINLAY, W. H., M.B., C.M. Edin. (Redcar); BODY, T. M., L.R.C.P. Lond., M.R.C.S. (Middlesbrough); MOORE, P. W., M.B. Lond. (Coggeshall); FIRTH, I. G. M., M.B., Ch.B. Aberd. (Osmotherley); STREATFIELD, P. W., L.R.C.P. Lond., M.R.C.S. (Waltham Abbey).

Vacancies.

For further information refer to the advertisement columns.

Barnstaple, North Devon Infirmary.—H.S. £150.
Bolton Infirmary and Dispensary.—Asst. H.S. £100.
Cardiff Royal Infirmary.—Two H.S.'s. Each £100.
Cheshire Joint Sanatorium, Market Drayton, Salop.—Second A.M.O. £350.
City of London Hospital for Diseases of the Heart, Victoria Park, E.—H.P. £125.
Dorset Mental Hospital, near Dorchester.—Deputy Med. Supt. and Pathologist. £575.
Farringdon General Dispensary and Lying-in Charity, Holborn Circus, E.C.—Hon. P. and S.'s.
Greenwich and Deptford Guardians' Hospital, Vanbrugh Hill, Greenwich.—Radiographer. £400.
Hemel Hempstead, West Herts Hospital.—R.M.O. £200.
Herts Mental Hospital, Hill End, St. Albans.—Locum Tenens A.M.O. 7 guineas weekly.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. £50.
Laboratories of Pathology and Public Health, 6, Harley-street, W.—Fourth Asst. Pathologist. £500.
Leeds Township Infirmary, Beckett-street, Leeds.—A.M.O. £275.
Manchester, Ancoats Hospital.—Sen. Res. Surg. O. £225.
Miller General Hospital for South-East London, Greenwich-road, S.E.—H.P. £150.
Orkney, Parish of Eday.—M.O.
Penmaenmawr, Pendyffryn Hall Sanatorium.—Asst. P. £400.
Plymouth Borough.—Port M.O. £750.
Romford Recuperative Hostel.—Res. Med. Supt. £500.
Royal Army Medical Corps.—Commissions.
Royal London Ophthalmic Hospital, City-road, E.C.—Refraction Asst. £100.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Anæsthetist. £105.
St. Mary's Hospital, London, W.—Med. Supt. £400.
St. Pancras Dispensary, 39, Oakley-square, N.W.—R.M.O. £225.
St. Thomas's Hospital Medical School.—Demonstrator of Anatomy. £400.
Salisbury General Infirmary.—H.S. £200.
Stoke-on-Trent Education Committee.—School Dentist. £500.
Stoke-on-Trent, North Staffordshire Infirmary.—H.S. £200.
Torquay, Local Education Authority.—Asst. Sch. M.O., &c. £600.
Wakefield, Clayton Hospital.—H.S. £200.

The Chief Inspector of Factories, Home Office, London, S.W., announces vacancies at Newark, Littlehampton, Clackmannan, and Oakengates.

Births, Marriages, and Deaths.

BIRTHS.

CRANSTOUN.—On Jan. 3rd, at Perry Hill, Worplesdon, the wife of Gordon Cranstoun, M.B., B.Ch., of a son.
ROSS.—On Dec. 27th, 1923, at Patna, India, the wife of Lieut.-Colonel William C. Ross, I.M.S., of a daughter.
WEBSTER.—At 1, Carden-terrace, Aberdeen, on New Year's Day, the wife of A. U. Webster, M.C., M.A., M.B., Fraserburgh, of a daughter.

MARRIAGES.

MILLS—KELSEY.—On Dec. 8th, 1923, Lieut.-Colonel Bernard Langley Mills, M.D., F.R.S.E., R.A.M.C. (retired), to Leila Susanne, widow of Reginald Kelsey and daughter of the late G. S. Cardew, M.D., J.P., Inspector-General of Hospitals, Bengal Army.

DEATHS.

BAMFORD.—On Jan. 4th, at The Hermitage, Uttoxeter, Charles Robert Bamford, M.R.C.S., L.R.C.P., aged 64.
BIRDWOOD.—On Jan. 2nd, at Twickenham, Roger Alan Birdwood, M.D. Camb., in his seventy-third year.
FISHER COCK.—On Jan. 4th, at Ashford, Middlesex, Morris Fisher Cock, M.R.C.S., L.R.C.P., aged 67.
GWYNN.—On Dec. 29th, 1923, at St. Mary's House, Whitchurch, Shropshire, Charles Henry Gwynn, M.D. Edin., M.R.C.S. Eng., aged 69.
LAMOND LACKIE.—At 7, Randolph-crescent, Edinburgh, on Jan. 5th, very suddenly, James Lamond Lackie, M.D., F.R.C.P.E.
SANKEY.—On Jan. 4th, at Woodstock-road, Oxford, Julius Ottaway Sankey, M.R.C.S., L.R.C.P.
TWEEDY.—On Jan. 4th, suddenly, after a short illness, John Tweedy, F.R.C.S., LL.D., Kt., aged 75.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

ALCOHOLISM IN VARIOUS SOCIAL CLASSES.*

BY H. M. VERNON, M.D. OXF.,
AUTHOR OF "INDUSTRIAL FATIGUE AND EFFICIENCY," ETC.

THE recent publication of the supplement to the seventy-fifth annual report of the Registrar-General exhibits the incidence of alcoholism in various social classes of the community, and permits the drawing of a number of conclusions as to the factors concerned in the promotion and the prevention of alcoholism. The report, publication of which was delayed by the war, relates to the years 1910–12, and might therefore be thought to be quite out of date, but I believe that the information to be adduced will negative this view. It is true that the 1920–22 data are likely to be more instructive, as they will show the effects of the great reduction in alcohol consumption caused by high taxation and by changes in the hours of sale, but they are not likely to be published for many years to come.

The report contains 191 tables of figures, recording the mortality of various groups of men from certain specified diseases, including "alcoholism" and "cirrhosis of the liver." The deaths recorded under these headings are more strictly defined than those recorded in previous reports under the headings of "alcoholism" and "diseases of the liver," but for purposes of comparison some of the present data have been calculated on the old basis, as well as on the new one. Considering only the men who died between the ages of 25 and 65, the group of "occupied and retired males" in England and Wales, which numbered 7,852,042 individuals, showed a mortality of 4 from alcoholism and of 13 from cirrhosis of the liver, when estimated on the present scale, whilst on the old scale it was 7 for alcoholism and 16 for diseases of the liver. Since 1900–02 the comparative mortality figure (which relates to a standard population of 71,005 men, aged 25 to 65) has fallen from 1004 to 790, or 21 per cent., whilst the mortality from alcoholism and liver diseases has fallen from 43 to 23, or 47 per cent. This relatively greater improvement in the alcohol mortality than in the general mortality is a very satisfactory feature, which is likely to be maintained in the 1920–22 data, when they are published. Thus the total deaths of all males in England and Wales from alcoholism and liver diseases is stated (in "The Alliance Year Book," 1922, p. 223) to be 84 per million in 1920, as compared with 156 in 1910, and 294 in 1900. The alcohol mortality in various social classes is shown in the table:—

Alcohol Mortality in various Social Classes.

—	No. of groups averaged.	Deaths from alcohol of groups with comparative mortality of—						
		Under 600.	600 to 699.	700 to 799.	800 to 899.	900 to 1099.	1100 or more.	Mean per-centage
A	6 to 15	7(1·3)	10(1·6)	13(1·7)	15(1·8)	16(1·6)	—	1·6
B	2 to 4	7(1·2)	—	—	—	17(1·8)	28(2·3)	1·8
C	3 to 5	15(2·8)	24(3·7)	22(2·9)	—	—	—	3·2
D	2 to 6	16(3·0)	20(3·1)	23(3·0)	—	35(3·8)	—	3·2
E	2 or 3	—	—	—	—	53(5·0)	134(9·0)	7·0

Social Class.—A = Skilled and semi-skilled workmen. B = Unskilled workmen. C = Professional classes and clerks. D = Shopkeepers, &c. E = Brewers, publicans, &c.

The Registrar-General divides up the various occupational groups into eight social classes, but five of them (viz., 3, 4, 6, 7, and 8) may conveniently be classified together as "skilled and semi-skilled workmen," though I am excluding the groups engaged in the production and sale of alcoholic liquors. The other three social classes consist of "unskilled workmen," "upper and middle classes," and "intermediate," these latter consisting for the most part of shopkeepers. Some of the occupational groups are too small to yield reliable data, so I have ignored any group in which the number of deaths from alcohol (i.e., alcoholism and cirrhosis of the liver) was less than ten. This plan tends to eliminate rather too large a proportion of the more abstemious groups, but the error introduced thereby will not affect any of the arguments advanced. All the data referred to relate only to men between the ages of 25 and 65.

* An abstract of a paper introductory to a discussion before the Society for the Study of Inebriety, held in the rooms of the Medical Society of London, on Jan. 8th, 1924.

Alcoholism among Skilled and Semi-Skilled Workmen.

The combined class of skilled and semi-skilled workmen is by far the largest, so it will be considered first. The mortality of these groups from all causes varies between the extremes of 157 for gardeners and 1196 for potters, and for purposes of comparison I have split them up into the five divisions recorded in the table. The first division comprises the six occupational groups in which the comparative mortality was less than 600, and it will be seen that on an average these groups showed an alcohol mortality of 7. The next division includes the eight groups with a comparative mortality of 600 to 699, and their alcohol mortality averaged 10. In the succeeding divisions the alcohol mortality averaged 12, 15, and 16, so it follows that the alcohol mortality increased steadily as the general mortality increased. Expressed as a percentage on the general mortality, the alcohol mortality in the five divisions was 1·3, 1·6, 1·7, 1·8, and 1·6—i.e., it was practically constant.

What is the significance of the close correspondence between the two mortalities? In the first place, to what extent is the general mortality affected, indirectly, by excessive indulgence in alcohol? Evidence on this point can be obtained by comparing the causes of death in typical groups of individuals liable to excessive indulgence in alcohol with other groups who are not so liable. In order to render the comparison valid, it is essential that the groups compared should be men of similar social class, living under similar conditions as regards housing and general character of work (indoor or outdoor, light or heavy). The most suitable group provided by the Registrar-General is that of "inn, hotel—keepers; publicans; spirit, wine, beer—dealers," and for comparison purposes the group of "all shopkeepers." This includes men such as drapers, grocers, butchers, greengrocers, stationers, ironmongers, tobacconists, and chemists. From the mortalities of the two groups from diseases of the respiratory, circulatory, digestive, nervous, and urinary systems, it appears that in every instance the mortality of the publicans was 1·6 to 2·0 times greater than that of the shopkeepers. From alcoholism and liver cirrhosis it was 7·8 and 6·3 times greater, whilst the total deaths from these causes were 132 more numerous than in the shopkeepers. The total deaths from all causes were 557 more numerous, and if we deduct the deaths from alcohol, we find that the excess of deaths in the publicans which were presumably caused indirectly by alcohol come to 425, or about three times more than the direct deaths.

I have also compared two other occupational groups: these are barmen on the one hand and indoor domestic servants (other than those in hotels) on the other. They are not nearly such closely comparable groups as the previous pair, but they are the best I could find. It will be seen that the frequency of occurrence of the various diseases in barmen, as compared with domestic servants, was very variable, and ranged from 1·4 to 3·2. The total deaths from alcohol were 86 more numerous in barmen, whilst the deaths from all causes combined were 973 in excess. That is to say, the deaths due indirectly to alcohol were apparently ten times more numerous than those caused directly. This estimate differs widely from the former one, and all that we can conclude with safety is that the indirect effects of alcoholic excess are much greater than the direct effects, and are probably more than three times as great.

If, for the moment, we assume that the indirect deaths due to alcohol are ten times as numerous as the direct deaths, they still fail to account for more than a third of the rise of comparative mortality shown in the table. Thus, if comparative mortalities of 550, 650, 750, and 850 are corrected on the tenfold alcohol basis, they become reduced to alcohol-free mortalities of 473, 540, 607, and 685 respectively. Hence we must look elsewhere than to alcohol in order to account for the larger part of the variations in the general mortality of industrial workers. Evidence on this point, yielded by examining the occupational groups falling in the various divisions, suggests that the relationship between the alcohol mortality and the general mortality of industrial workers is very different from that described in publicans and barmen. Owing to the unhealthy conditions under which many of them carry on their work their general health suffers, and thereby they become readier victims to alcohol. Possibly they may indulge in no more alcohol than other men who work under healthier conditions, but may owe their greater mortality to diminished bodily resistance. On the other hand, it is probable that their reduced health makes them more ready to seek comfort in drinking, but, whatever the weight to be ascribed to these or other causes in accounting for the effects produced, there can be no doubt whatever that by improving the conditions under which industrial work is carried on, we shall reduce both the general mortality and the alcohol mortality. The better the factories are ventilated and lighted, the more

frequently changing and washing rooms are provided, whereby over-heated workers (especially miners and iron- and steel-workers) can change into dry clothes directly their day's work is over, the better will be the general health and self-respect of the men employed in industry and the greater their sobriety.

Alcoholism Among Unskilled Workmen.

The Registrar-General's class of "unskilled workmen" includes only a few and widely divergent occupational groups. Two of them, the brickmakers and the platelayers, have a comparative mortality rate of 567 and 621 respectively, and an alcohol mortality of 8 and 6. Hence they resemble the best of the skilled workers. This is owing to the fact that they lead a vigorous open-air life. The remaining groups of unskilled workmen are very different, for they show both a high general mortality and a high alcohol mortality. One division, with a comparative mortality of 900 to 957, includes coal-heavers, carmen, and cabmen and grooms. Their alcohol rates are 12, 17, and 23 respectively, and represent the same percentage on general mortality as is observed in the corresponding groups of skilled workmen. The remaining groups of unskilled workmen are not represented at all amongst the skilled, as their comparative mortality varied from 1102 to 1507, and their alcohol mortality from 22 to 35. They comprise watermen, dock labourers, messengers, and costermongers, and they are clearly of a different social class from the majority of skilled workmen, as they are not only unskilled, but they are casual workmen.

Alcoholism Among Professional Classes and Shopkeepers.

Widely as the unskilled labourers differ from the skilled, there is in some ways a greater jump still when we proceed to the other two social classes tabulated by the Registrar-General. Social Class I., comprising the "upper and middle classes," consists chiefly of professional men and clerks. Their comparative mortality figure ranges from 506 to 863, and has a distinctly lower average than that of the other social classes. In spite of this, their alcohol mortality is nearly twice as great as that of the skilled industrial workers. It will be seen from the table that whilst the alcohol mortality of the first three divisions of skilled workmen was 7, 10, and 12, that of the corresponding divisions of professional men and clerks was 15, 24, and 22. The three groups with a general mortality of less than 600 consists of schoolmasters, bank officials, and of civil service officials and clerks. Their alcohol mortality is 12, 17, and 17 respectively, so the schoolmasters alone are comparable in alcoholic restraint to the average skilled industrial worker. Best of all is the group of clergy, with a general mortality of 443 and an alcohol mortality of 4, but owing to the total number of deaths from alcoholism being less than 10, the group is excluded from my classification.

The division with a comparative mortality of 600 to 699 comprises railway officials, builders, doctors, lawyers, and artists, and their alcohol mortality is 16, 20, 27, 28, and 31 respectively. That is to say, the lawyers and doctors, whose professional duties teach them daily the evils of alcoholism, are themselves amongst the greatest sinners. The third division, whose general mortality varies from 724 to 765, comprises insurance agents, law clerks, commercial travellers, and chemists and druggists. Their alcohol mortality is 8, 24, 25, and 35 respectively. Finally, the large group of commercial clerks has a general mortality rate of 863, and an alcoholic mortality of 20. In the table this group has been put with the 700–799 division for averaging purposes.

The percentages of alcohol mortality on general mortality have an average value of 3·2 for the shopkeepers, or the same as that observed in the professional classes. It is twice the percentage alcohol mortality observed in the skilled workmen, and nearly twice that in the unskilled workmen. What are the causes of these tremendous differences? Firstly, the workmen have to pursue occupations which are chiefly of a muscular character, and are often carried on in the open air. On that account they maintain themselves in a better physical condition than the professional men and shopkeepers, who are mostly employed indoors on work which requires no muscular effort, and is frequently sedentary. Secondly, the workmen, as a class, are not so well-to-do as the professional men and shopkeepers, and can less readily afford expenditure on alcoholic liquors. However, this argument is not one of great importance, for we have seen that clerks, taken as a whole, have as great an alcohol mortality as professional men, though they are certainly less well-paid, whilst the badly paid unskilled workmen have a greater alcohol mortality than the better-paid skilled workmen.

The Effect of Drinking Spirits.

The chief reason of the difference between the alcohol mortality of workmen and of the other two classes is due, I believe, to the form of intoxicants indulged in. The workman takes his alcohol mostly in the form of beer, whilst the professional classes and the shopkeepers take theirs in the form of spirits. As spirits contain eight to ten times more alcohol than beer, it is very much easier to introduce excess of alcohol into the system. Again, spirit-drinking is easily indulged in at all times of the day by those who can afford to keep a supply of spirits at home, and, as Dr. W. C. Sullivan pointed out nearly twenty years ago, the frequent drinking of small doses is peculiarly apt to bring about chronic alcoholism, though it does not cause drunkenness. Convivial drinking, on the other hand, is very likely to lead to drunkenness, but as it is indulged in only occasionally, it is much less harmful to the system.

PUBLIC HEALTH IN BURMA.[1]

THE population of the area under registration for vital statistics in Burma numbered 10,771,190 at the census enumeration of 1921, showing an increase of 946,800 since 1911; this amounts to 9·64 per cent. The immigrants numbered 331,992 and the emigrants 303,806, the former showing a decrease of 9188, and the latter an increase of 55,821 on the previous year's statistics. The birth-rate was 29·85 per 1000, as compared with 33·78 in the previous year and 33·33 for the quinquennium; but if the latter ratio be corrected, to allow for the exaggeration due to the use of the 1911 census population as a basis of calculation, the quinquennial ratio becomes 31·67. There was a considerable difference between the ratios for Lower and Upper Burma, the former being 26·90 and the latter 34·82 in 1921; and for the quinquennium (corrected) 29·67 and 34·25 per 1000. Lieut.-Colonel C. E. Williams, I.M.S., the Director of Public Health for the province, states, however, that "the evidence of the 1921 census points to the general birth-rate in town and country being 50 per mille or above, confirming the estimates of previous censuses and the experience of officers of this department." There appears to be considerable "neglect of registration by the public and local registrars." The general death ratio for the province was 21·45 per 1000, as compared with 27·40, the corrected ratio for the quinquennium, 1916–20. In the rural areas (with a population of 9,558,291) the mortality was 19·66; in the towns (population 1,212,899) the ratio was 35·55 per 1000; among the former the ratios varied from 14·37 in Myingyan and 16·23 in Sagaing (both districts in Upper Burma), to 28·00 in Sandoway (Lower Burma) and 29·53 in Kyaukse (Upper Burma). It is noteworthy that the lowest and highest mortality ratios occurred in two rural districts adjoining each other, Myingyan and Kyaukse; in the same two rural districts the quinquennial death-rates had been 23·01 and 43·06 respectively. The ratios of death from "fever" in 1921 were 3·00 and 10·28 per 1000. Among the towns the total mortality varied from 18·38 at Yamethin, in Meiktila division, and 18·63 at Syriam in Pegu division, to 54·36 at Prome (also in Pegu division), and 73·16 at Mawlamyainggyun in Irrawaddy division; at this latter town fever, dysentery, cholera, and plague were prevalent. At Rangoon and Mandalay the birth ratios were 18·29 and 44·41 respectively; the death ratios were 35·28 and 43·27.

Infantile Mortality.

In regard to infantile mortality there has been a marked improvement. The ratio per 1000 births was 172·06, compared with 186·65 in 1920, 216·90 in 1919, and 271·24 in 1918; the ratio for Upper Burma, which had been 260·33 in 1919 (compared with 185·83 in Lower Burma), has fallen to 173·65 (compared with 170·84 for Lower Burma). "Never before has the Upper Burma ratio so closely approached that of Lower Burma." In the rural areas the mortality declined from 205·33 per 1000 births in 1919 to 177·92 in 1920, and 160·37 in 1921: in the towns from 320·99 in 1919 to 271·22 in 1920, but rose to 278·84 in 1921. Very high infantile mortality was recorded in several large towns, such as Rangoon (322·67), Mandalay (341·85), and Shwebo (458·96): but in some cases it is supposed that a large number of births (mainly female) were not registered. A child welfare endowment fund was organised at the instance of Lady Craddock, wife of the Lieutenant Governor, to coördinate the work of the societies already established, and is destined to become a valuable asset in the movement in this province. 1095 confinements were attended in Rangoon and 456 in Mandalay; there was not a single death among the mothers in these cases. At various towns in the province committees of European ladies render most valuable assistance in regard to the welfare of children, and at Taunggyi (Upper Burma) Colonel Williams "was greatly struck by the interest shown in the movement by a large number of Shan ladies and women of the labouring class."

[1] Report on Public Health Administration. Rangoon Government Press. 1922.

Infectious Diseases.

Cholera was present in all districts in Lower, and in five out of the 12 in Upper Burma, with six isolated cases in five other districts. Not a single death was reported from this cause in Lower Chindwin or Meiktila districts. The total deaths numbered 3791 (0·35 per 1000); in Sandoway district the mortality was 3·48, and in Mergui 4·50 per 1000. The ratio for towns was 0·94 in Lower and 0·09 in Upper Burma; for rural areas 0·45 and 0·09 respectively. The chief prevalence occurred in the Irrawaddy division, where serious outbreaks occurred in every district during the first five months of the year, in which period 1130 deaths occurred from this cause. "The protective influence of a pure and protected water-supply against the spread of cholera infection is illustrated by the experience of Monywa town, where outbreaks of the disease were of almost annual experience until 1916, when the water-supply scheme was completed, since which year no death from cholera has been returned from that town." There was a great reduction in small-pox, from which cause 987 deaths were returned (0·09 per 1000), against 2853 in 1920; in Lower and Upper Burma the ratios were 0·07 and 0·13 respectively; in Thaton district (Tenasserim division) the mortality was 0·42; in Mandalay 0·50; in five districts there was not a single death from this cause (Kyaukpu, Hanthawaddy, Pyapon, Tavoy, and Yamethin). Plague caused 4403 deaths (0·41 per 1000), the ratios for Lower and Upper Burma being 0·53 and 0·21 respectively: the corresponding quinquennial ratios had been 0·67, 0·70, and 0·61 respectively. Rangoon district had a mortality of 3·29 per 1000, representing 1126 deaths; for Mandalay district the corresponding figures were 0·94 and 334; and for Prome 1·64 and 609; for the whole province the death-rate from plague was 2·88 in the towns and 0·09 in the rural districts. Colonel Williams points out that there are two plague seasons in Rangoon, the first reaching its maximum prevalence in March or April, and the second in July or August; a simular incidence occurs at Prome. The causative influences or factors have not been determined: they may be connected with the presence of different species of rats or fleas, or special social or economic conditions. The chief preventive measures adopted were rat-destruction and inoculation: "both measures are optional, and neither is making much progress"; nevertheless, 471,549 rats were destroyed (405,178 in Rangoon), and 43,552 inoculations performed.

The "fever" death ratio (7·68 per 1000) compares favourably with that of the preceding quinquennium (10·83). "It is clear that the position in 1911 has nearly been regained in 1921, and that the influence of influenza in raising enormously the fever mortality ratios of the previous three years has to a great extent lapsed." In the several districts the ratios varied from 2·18 in Rangoon, 3·13 in Myingyan, and 3·94 in Ma-ubin to 16·0 in Tavoy; in the rural areas the range was from 3·0 in Myingyan to 16·61 in Tavoy, and for the towns from 2·18 in Rangoon and 2·26 in Danubyu to 15·07 at Mawlamyainggyun and 15·98 at Wakema. The statistics of death from actual malaria are available only for the towns, and these are not considered to be trustworthy. Enteric fever was reported as causing 231 deaths, but was probably much more widely distributed than would appear from the returns. There was some prevalence of influenza from time to time in all parts of the province. In towns 537 deaths were returned as due to this cause, of which 233 occurred in Rangoon and 103 in Mandalay; in rural areas 112 deaths were reported. Dysentery and diarrhœa caused 9728 deaths (0·90 per 1000); of these 8119 occurred in Lower and 1609 in Upper Burma. "There can be little doubt that deaths from these complaints are much more frequent than the Upper Burma returns indicate." In 22 jails 8896 prisoners were examined for ankylostoma infection, of whom 67·43 per cent. were found to be infected; chenopodium oil was administered in capsules with good results. The Port Health Station at Rangoon is now provided with a commodious shed for examination of all classes of passengers, and two steam disinfectors have been installed; this port now compares favourably in its health work and accommodation for passengers with anything yet accomplished in India.

Prison Administration.[2]

In the Report on Prison Administration in Burma for 1921 it is stated that there are indications that the "jail population is still steadily rising." At the beginning of the year the total prisoners in the seven central and 23 district jails numbered 15,796; during the year 45,639 prisoners were received and 45,204 discharged, the number remaining at the end of the year being 16,231. The daily average population was 16,088, of whom 15,009 were convicts; of these 135 were females. It had been found that the illicit use of tobacco was the great cause of breaches of discipline; Lieut.-Colonel H. H. G. Knapp, I.M.S., Inspector General of Prisons for the province, who forwards this report, recommended that tobacco in moderation should be allowed as a reward for good conduct. The local government approved of the suggestion, and at the Moulmein jail the experiment was tried, by allowing a cheroot once a day to well-behaved prisoners and to convict officers; the competition to get into the smokers' list was keen, and the jail superintendent stated that he had "seen nothing but good resulting from this experiment," the number of punishments in this jail falling from 683 to 211—that is, from 86·12 to 30·89 per cent. of the prison population. Colonel Knapp desires an extension of the method to some other jail to serve as a check to this experiment. The Burmese (of both sexes) are keen smokers, and "devote much energy to the congenial task of outwitting the staff, with fair success." At Prome a "jail tobacco treasury" was discovered hidden in a loft in the female ward, access to which involved a climbing feat by one of the young female convicts. In regard to the health of the prisoners, for the average population of 16,088 the average daily sick ratio was 24·06 and the mortality 16·22 per 1000; the former was higher than in any of the four years preceding (in which it varied from 15·19 in 1917 to 23·32 in 1918), but the death-rate was considerably lower (19·0, 25·59, 28·53, and 19·92 in the four years respectively). The increase in daily sick "shows that care was taken to admit those that required treatment and that the 24 hours rule was observed better than last year. This is especially true of the Rangoon jail." Colonel Knapp has no doubt good reason for this explanation of the increase in this particular instance, but it is obviously not applicable as a general proposition.

In the seven large central jails at Rangoon, Insein, Bassein, Myaungmya, Thyetmyo, Mandalay, and Myingyan, the health statistics showed very wide variations. At Rangoon, with an average strength of 2336 (not including 12 Europeans), the admissions to hospital amounted to 860·02 per 1000, the average daily sick were 38·53, and the deaths only 10·27 per 1000; at Thyetmyo (average strength 1029) the corresponding ratios were 69·00, 6·80, and 17·49. The death-rate was highest at Mandalay (25·97), and Myingyan (24·31); at Myaungmya it was only 9·83. In the 24 district jails the hospital admissions varied from 51·72 per 1000 at Sandoway and 72·99 at Kyaukpyu, to 958·51 at Prome and 1434·18 at Akyab; the average daily sick were only 7·30 per 1000 at Kyaukpyu, 6·85 at Shwegyin, and 4·20 at Magwe; at Pagan, Katha, Mogok, and Tavoy the ratios were 27·27, 27·78, 32·61, and 33·11 respectively; not a single death occurred in the jails at Mergui, Mogok, Shwebo, Taungdwingyi, Meiktila, Yamethin, or Thaton, the combined average strength of the seven jails being 718. In the other district jails the mortality varied from 6·62 at Tavoy and 6·85 at Shwegyin, to 57·55 at Paungdè, and 136·36 at Pagan. For the province as a whole the chief cause of sickness among the convicts (numbering 15,009 out of the total 16,088 daily strength) was malaria and its sequelæ, enlarged spleen and cachexia, with an admission ratio of 39·31 (590 cases), but only four deaths are returned as due to this cause (0·27 per 1000). For dysentery there were 574 admissions (38·24 per 1000) and 27 deaths (1·80 per 1000). Only four cases of cholera occurred, three at Akyab and one at Toungoo, all fatal. There has been a marked decline in tuberculous disease, "and this is the more remarkable, in that medical officers and their staffs pay greater attention to early diagnosis and segregation than formerly." The admissions numbered 180 and the deaths 52. Pneumonia, on the other hand, increased from 49 admissions and 14 deaths (presumably in 1920) to 79 admissions and 27 deaths in 1921 (all among convicts); 22 of the admissions and four deaths occurred at Mandalay. There were 41 admissions for enteric fever, with 11 deaths, 17 of the cases occurring at Mandalay, 11 at Insein, and five at Rangoon. It is stated that "typhoid is rife in Mandalay town," where 81 deaths from this cause were recorded, probably an under-estimate. Much good work is done at the Meiktila Juvenile Jail, where there was a daily average of 133 convicts under the care of a Burman superintendent. The boys are instructed in carpentry, shoemaking, sawing, and (most important of all) in agricultural work on a farm attached to the jail. The after-history of 113 cases showed that 77 were in some kind of regular work, and only seven are known to have relapsed.

[2] Rangoon Government Press. 1922.

HEALTH CONDITIONS IN NYASALAND.

THE European population at the end of 1922 was returned at 1499, the Asiatic at 662, and the Native at 1,185,655. During the year the health of the Protectorate was satisfactory. There were a few cases of small-pox in the early part of the year, the residue of an outbreak which occurred at Mlanje in 1921. No case of plague was reported. Fewer cases of venereal diseases were recorded than in 1921: 341 cases of yaws were treated, as against 235 in the previous year. Most of these cases occurred at Karonga; 70 rural

dispensaries were opened during 1922. These are worked by natives, who have had an elementary training in dealing with minor ailments and in dressing wounds. Although these dispensaries were open for about half the year only, their existence resulted in double the number of native out-patients being treated—39,000, as against 19,000 in 1921. The in-patients numbered about the same as in the previous year—2300. As regards Europeans, as in 1921, about 500 were treated by the medical department, and there were 15 deaths, six of which were due to blackwater fever. Malaria accounted for nearly 28 per cent. of the European illnesses. Amongst the native population eight cases of sleeping sickness were recorded. Villages infected with human trypanosomiasis were removed to a "fly-free" area. The rainy season, 1921–22, was an unsatisfactory one, as the rainfall was much below normal, and conditions of drought, followed by a scarcity of native foodstuffs, prevailed throughout the southern part of the Protectorate. A considerable amount of suffering was entailed by the famine, but there is no reason to think that the deaths from starvation were numerous. The natives bore the distress and suffering with courage and fortitude, and expressions of gratitude to the Government were received from principal headmen for the assistance rendered to them and their people. The climate of Nyasaland in its essential features is similar to that of the rest of Eastern Africa within the tropics, but it is necessarily diversified owing to variations in latitude, altitude, and general configuration of the terrain, presence or absence of rivers, forests, &c., but as a large proportion of the Protectorate lies at an altitude of 3000 feet or more the heat is not generally excessive. The south-east monsoon commences to blow strongly in September, and the first rains may be expected any time after mid-October. From their commencement to the end of December it is usual to experience violent thunderstorms and heavy precipitation in a few hours, followed by an interval varying from 1 to 15 or 20 days of intense heat. With the return of the sun from its southern limit of declination the thunderstorms diminish in intensity and frequency, and are replaced by steady rain, January, February, and March being usually the wettest months as regards duration of rainfall, as well as actual amount. After March the frequency and intensity of rainfall diminishes rapidly, and from May to September the climate is comparatively cool and dry.

DUSTLESS SWEEPING.

WE have had brought to our notice a preparation bearing the name of "Kleensweep," which, it is claimed, offers a certain and simple method of eliminating the raising of dust in the operation of sweeping floors. A few ounces of the preparation are laid in a straight line across the floor and swept along with the dust which it absorbs and entangles. One preparation is suitable for use on linoleum, wood or concrete, another for carpets. Both contain substances which exert a cleansing and disinfecting action and emit an aromatic odour that is distinctly agreeable. We have tried the preparation on floors of various kinds and consider that it would take a useful place in factories and institutions where the old-fashioned method of sprinkling floors with water or tea-leaves is employed. "Kleensweep" is sold in sacks at 11*s.* per cwt., and can be obtained from the Kleensweep Manufacturing Co., 35 to 37, Verulam-street, London, E.C. 4.

THE WELLCOME FOUNDATION.

THE Wellcome Foundation, Ltd., has recently been registered as a private limited company, with a capital of £1,000,000 to acquire from Mr. Henry S. Wellcome the well-known business of Burroughs Wellcome & Co., and the various scientific institutions founded and owned by Mr. Wellcome, who will be the governing director of the Foundation during his life. We understand that the Foundation has been formed entirely for private and family reasons, and that the conduct and management of the business will be continued on exactly the same lines as heretofore. The scientific institutions will continue as in the past under separate scientific direction.

PENSIONS TO WIDOWS OF DISABLED MEN.

THE Minister of Pensions announces a further decision of the Government in respect of claims to pension by widows of men disabled in the war, who die more than seven years after discharge or removal from duty: (1) A new Article will be inserted in the Royal Warrant providing, without any time limit, for the grant of pension at maximum rates to the widow of any pensioner whose death is certified to be wholly due to the nature or condition of his pensioned disability, such nature or condition being directly the result of his war service. The formula will cover cases of serious aggravation of a disability not directly due to war service. (2) In regard to claims made under the new Article and rejected by the Ministry of Pensions, there will be a right of appeal to the Pensions Appeal Tribunal. (3) Other cases occurring beyond the seven years' limit in which the man's death, though not wholly and directly the result of war service, was nevertheless so far connected with it as to justify some measure of compensation, will be considered. Eligibility for pension under that Article is governed by the extent to which the man was recognised during his lifetime to be disabled by war service, but the minimum limit of 50 per cent. which was laid down is now to be reduced to 40 per cent.

THE JOHN HANCOCK CARTRIDGE PEN.

THE utility and convenience of many fountain pens have often to be discounted by the troubles attending their filling. In the case of the John Hancock Cartridge Pen (Ingenuities, 23A, Old Bond-street, London, W.), a specimen of which has been sent to us for trial, filling troubles are obviated by the use of a sealed metal cartridge of special ink which is used for recharging the pen. The act of screwing in the cartridge perforates the sealed end and allows the ink to flow to the nib. Each cartridge contains sufficient ink for writing on an average 6000 words. The barrel of the pen is constructed of stout hard rubber, and an ingenious "feed" gives an even flow to the ink. A short trial of the pen seems to justify the claims of the makers that it does not leak or clog. The nibs, which are fashioned for different types of handwriting, are made of 14 carat gold, with specially treated iridium points, and the complete pen is sold in a neat box containing three cartridge refills in a pocket case, at the price of 21*s.* Packets of three refill cartridges—estimated at six weeks' supply—can be obtained for 1*s.*

INDEX TO "THE LANCET," VOL. II., 1923.

THE Index and Title-page to Vol. II., 1923, which was completed with the issue of Dec. 29th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

An Address

ON

FRACTURES FROM AN OPERATIVE STANDPOINT.

*Being the Presidential Address delivered before the Dublin University Biological Association.**

BY WILLIAM PEARSON, M.D., B.CH. DUB., F.R.C.S. IREL.,

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NOT many years have elapsed since the subject of fractures was brought before this Association by a former president, Sir William Wheeler, in an interesting and able historical survey. Nevertheless, I have chosen it without hesitation for my address, and I feel that in doing so no apology is necessary. The study of fractures is a fascinating one, beset with difficulties and problems yet unsolved, and in recent times there is no subject which has occupied the attention of surgeons to a greater extent than that of fractures and their treatment.

TREATMENT OF FRACTURES BEFORE AND DURING THE WAR.

For some years prior to the outbreak of the Great War the problems of the treatment of simple fractures had become of supreme interest. Operative measures, rendered possible by the advancements of modern surgery, had been introduced and were claiming an increasing number of adherents. In the British Isles this position was due chiefly to the work of Sir Arbuthnot Lane, whose faultless technique and brilliant results had attracted world-wide attention. The relative merits of conservative and operative treatment were so keenly debated, and the question had reached such importance, that in 1910, following a discussion at the annual meeting of the British Medical Association, a committee was appointed by the Council of the Association "To report on the ultimate results obtained in the treatment of simple fractures with or without operation." In 1912 its report was published,[1] based on investigations of over 2900 cases of fractures of the long bones. This report merits close study; but it must suffice here to say that its conclusions, while carefully guarded, were, on the whole, favourable to operative treatment. It demonstrated clearly the close relationship between good anatomical and good functional results, and also showed that in a considerable proportion of cases both open and closed methods of treatment left much to be desired.

In America, and on the Continent also, the subject was exciting great interest, and the operative treatment of simple fractures formed one of the topics for discussion at the French Surgical Congress in 1911. Although no agreement was reached, there is no doubt that operative measures, especially those advocated by Lane, were widely practised at this period.

With the outbreak of war in 1914, when surgeons were faced with the task of dealing with overwhelming numbers of grossly infected compound fractures, fresh problems arose. It was recognised that direct fixation by operative means was not only inadvisable but dangerous in such cases; operations on the fracture were confined to those dealing with infection, and the attention of surgeons was turned once more to indirect methods of control. The great value of extension and the Thomas's splint—so long insisted on by Sir Robert Jones—became apparent; non-operative treatment was enormously improved, and excellent results were obtained in many cases which, in the early stages of the war, would have proved hopeless. Consequently, operative treatment for the fixation of fractures has largely fallen into disuse and is, I think, not employed as frequently as it should be at the present time.

In spite of all progress, it is natural that many unsatisfactory results should have followed the serious fractures of warfare. Vicious union and non-union have been common sequelæ and constitute problems with which orthopædic surgeons have been much concerned, and in which operative measures are clearly indicated in many cases. In bringing my subject before you to-night no comprehensive review is possible, and I shall confine my remarks to problems which are of general interest at the present time.

From an operative standpoint fractures may be conveniently divided into (1) recent fractures, and (2) old-standing cases. In the former, apart from infection, operation is usually undertaken for the purpose of securing accurate adjustment or "setting" of the fragments; in the latter it may be required to remedy mal-union or non-union.

RECENT FRACTURES.

In the treatment of recent simple fractures operative measures are not to be lightly undertaken. As major surgical procedures they are not devoid of risk; they possess peculiar difficulties and dangers, and should never be attempted except under favourable circumstances. Now more than ever, with the knowledge and experience gained in the war, it is safe to say that the majority of recent simple fractures can be efficiently treated by non-operative means. There remains, however, a number of cases in which such measures offer little prospect of success, and in these operation is indicated provided that by it prognosis is definitely improved. The balance between operative risk and improved outlook must always be preserved.

The selection of cases for operative treatment requires experience and judgment, and should be guided by several factors. Of these the most important are the precise anatomical features of the fracture, which can only be determined by adequate X ray examination. In this matter the coöperation of radiologist and surgeon is essential. Skiagrams which may be fully instructive to the radiologist may not convey the necessary information from the viewpoint of surgical treatment, and the surgeon himself must clearly interpret and visualise the fracture if misconceptions and errors of judgment are to be avoided. Gross displacement of the fragments is not in itself an indication for operative treatment. In many cases reduction by manipulation may be easily and rapidly effected; in others, with much overlapping of the fragments, extension may prove efficient. Doubtful cases should always receive the benefit of preliminary non-operative treatment, and the results should be confirmed by further radiograms. The age, occupation, and general condition of the patient must also be considered. Old age does not necessarily constitute a barrier to operation, but the risks are greater and the prospects of a good functional result (even after successful operation) are more remote. In children operation will be rarely indicated; non-operative measures yield a high percentage of success, and young bones are not well adapted to all forms of operative fixation. In general, extensive comminution will contra-indicate operation.

With fractures, as with other orthopædic cases, it must also be remembered that operation is but one step in treatment, and that careful post-operative supervision is necessary if successful results are to be obtained. Statistics show that with proper selection of cases the operative mortality is negligible, and the principal risks which may be urged against the operative treatment of simple fractures are sepsis and non-union. These risks are common to all methods of direct operative fixation, but in the vast majority of cases their occurrence is due to one or both of two technical errors—faulty asepsis and imperfect fixation of the fracture—and are therefore avoidable.

* The address as delivered was illustrated by a series of excellent skiagrams.

Sepsis.—The occurrence of sepsis is disastrous. At the best it means a prolonged convalescence and ultimate removal of any foreign body employed to secure fixation: while the possibilities of osteomyelitis, non-union, pyæmia, and amputation cannot be ignored. With faulty technique the risk of sepsis is increased by permanent burying of foreign bodies in the tissues. It has also been urged that, apart from errors of asepsis, the presence of a foreign body in the bone may produce suppuration, but Hey Groves[2] has shown experimentally that this is true only if fixation is insecure; and clinical experience supports this view.

Non-union.—Apart from sepsis and insecure fixation, the risk of non-union has been exaggerated. Accurate reduction and firm fixation will result in minimum callus formation—a condition paralleled by the faint scar of an incised wound which heals accurately by first intention—and only in this sense can delayed union be considered common. Consolidation of definitive callus is at all times a tardy process, and for several weeks post-operative skiagraphic appearances may simulate non-union if no provisional callus is seen. In this connexion the manner in which the periosteum is treated at operation is of some importance: subperiosteal exposure and fixation of the fracture favours the development of subperiosteal callus and minimises the risk of non-union. With good technique non-union is rare, and must then be attributed to operative trauma and interference with the blood-supply at the site of fracture. The danger is so remote that it should not be allowed to weigh unduly against operation. In a series of 58 cases of simple recent fracture on which I have operated there has been no instance of infection, delayed union, or non-union.

THE OPERATION.

The most favourable period to operate is towards the end of the first week after injury. This delay adds nothing to the difficulties, and the tissues have then become more resistant to infection. With much swelling of the limb further postponement is desirable, and operation may be performed, if necessary, even at the end of three or four weeks. In these later cases the early callus should be carefully cleared (and preserved) with the periosteum from the ends of the bone and medullary canal before the fracture is adjusted.

Reduction by open operation does not always entail the use of direct means of fixation, and where there is no tendency to recurrence of the displacement the wound should be closed without further interference. If direct fixation is necessary various methods are available, none of which is entirely free from objection or applicable to all cases. The method to be selected will depend on the individual fracture, but certain general principles must always be followed. These may be briefly summarised as: (1) detailed planning of the operation in advance by study of the skiagrams; (2) rigid asepsis; (3) free incisions; (4) careful hæmostasis; (5) accurate anatomical reduction of the fracture; (6) secure fixation; and (7) accurate closure of the wound.

The reduction of the fracture may be, and often is, the most difficult step in the operation. It is to be accomplished by manual dexterity rather than by force, and skill in the manœuvre can only be acquired by experience. Traction on the limb by means of extension is usually unnecessary, but may be employed in cases of long oblique and spiral fractures if much overlapping is present. In these cases the greatest difficulty may be encountered, and preliminary extension for some days is advisable. It should be remembered that reduction of displacement is the prime object of the operation, and nothing short of anatomical accuracy should satisfy the surgeon. Incomplete reduction is a common cause of bad results, and should be regarded as an operative failure.

METHODS OF FIXATION.

I will now refer briefly to some of the principal methods of fixation.

Plating.

Plating, or fixation by screws and plates, enjoyed much popularity at one period. In Lane's hands the method achieved great success, but owing to adverse criticisms and the number of failures reported by others it is now generally regarded with disfavour. The mechanical defects of plates and screws as a means of fixation, to which Hey Groves[3] has drawn attention, impose definite limitations to the use of the method which have been frequently overlooked, and have contributed to many failures. It is, however, a method by which excellent results may be achieved, and is, in my opinion, still the method of choice in selected cases. Failures with Lane's plates may be attributed to (1) faulty asepsis; (2) defective mechanical technique; (3) selection of unsuitable cases; and (4) inefficient post-operative treatment. Transverse and slightly oblique fractures, especially those with irregular surfaces, and certain T-shaped and Y-shaped fractures are those best suited to plating; long oblique and spiral fractures—at all times most difficult from an operative standpoint—are not well adapted to Lane's method, and are better treated by other means. My own experience with Lane's plates has been most satisfactory. I have employed them in 28 cases of recent simple fracture with excellent results. There was no case of infection or delayed union, no loosening of screws (as proved by skiagrams), and the anatomical and functional results in all cases were perfect.

Various modifications of Lane's plates have been devised, of which the most efficient are Hey Groves's bolted and pinned plates. In these the plates are secured by bolts or split pins which transfix the entire thickness of the bone. Their application is more difficult, requiring much freer exposure of the bone, and in the event of sepsis they are more dangerous and difficult to remove; but as a means of fixation they leave nothing to be desired, and may be employed in cases where additional security is necessary.

Fixation by Bands.

The majority of long oblique and spiral fractures may be efficiently treated by means of extension. Operation is rarely necessary, and their accurate reduction by open methods may be exceedingly difficult. In these cases fixation is best obtained by the use of steel bands which bind the fragments together, and the best appliance of this type is the Parham-Martin band. Two bands may be passed round the fracture, but in many cases one will suffice to secure fixation. Adams's spring clip or bands or sutures of wire may also be employed, but are less satisfactory.

Wiring.

Fixation by wiring is most useful in such cases as fractures of the patella, olecranon, condyles of the humerus, and other small detached fragments. The patella and olecranon are best secured by passing the wire transversely through each fragment, or where the upper fragment is very small the wire may be passed through the muscle immediately above. Soft iron wire is the best material for the purpose, but silver, bronze-aluminium, and "belt lacing" wire are generally satisfactory. Silver wire may gradually undergo disintregation in the tissues, and should therefore be of stout size. Like screws, wire sutures as a means of fixation exhibit certain mechanical defects, and under the influence of continuous strong muscle pull will gradually cut their way through the bone.

Intramedullary Pegs.

The use of intramedullary pegs introduces a principle which is now frequently employed in bone-grafting operations. In this method alignment is

secured by inserting a cylindrical peg of bone or ivory into the medullary canal across the line of fracture. The procedure is simple and rapid and is admirably suited to many cases of transverse fracture, especially where there is a tendency to lateral displacement of one fragment. It also possesses the advantage that the pegs are gradually absorbed and do not remain as permanent foreign bodies in the bone, but it involves considerable interference with the blood-supply of the medulla and if sepsis occurs the presence of the peg is dangerous and its removal difficult. To minimise interference with the medullary circulation and to favour union I have employed grooved pegs in preference to those usually adopted. A size should be chosen which can be thrust into the canal without undue force, and it is wise to avoid drilling if possible.

OLD-STANDING FRACTURES.

In dealing with old-standing fractures the chief conditions which demand operative treatment are mal-union and non-union. Following simple fractures such conditions should be exceptional, but many cases have followed the compound injuries of warfare and these require special consideration. Not infrequently such cases are complicated by extensive scars in the skin and muscles, associated nerve or joint injuries, and the dangers of active or latent sepsis—all of which must be considered before operative measures are undertaken. Selection is often a matter of difficulty and should be guided by three considerations: (1) The degree of functional disability present; (2) the difficulties and risks of the operation; and (3) the prospects of definite functional improvement. It is unprofitable to correct deformity if function is not improved and such results should be regarded as operative failures. By strict attention to these points meddlesome surgery will be avoided.

Mal-Union.

With rare exceptions, mal-union is due to faults in early treatment: the principal causes being primary incomplete reduction, inefficient splinting, inefficient extension, and premature removal of support whereby a recently united fracture is exposed to weight-bearing and muscular strain before consolidation is advanced. Prevention of mal-union is generally easy; its cure may be difficult or impossible. In the shafts of long bones three principal types of mal-union occur—angulation, rotation, and overlapping. Angulation occurs most frequently in the lower limb, especially in the femur, and may be corrected by simple osteotomy. For large bones like the femur and tibia I prefer cuneiform osteotomy, as removal of a wedge yields more accurate apposition of the fragments and lessens the risk of subsequent displacement. If possible, the bone should always be divided just above or below the deformity and not through the line of original fracture; the latter may harbour latent sepsis and the bone is usually sclerotic, so that union may prove unsatisfactory. Occasionally the bone may be secured after operation by the use of pegs or a plate and screws, but this is usually unnecessary and undesirable. After operation the limb is fixed in a suitable position until sound union has occurred, and for this purpose in the lower limb I generally employ plaster-of-Paris. In civil practice angulation is frequently seen in cases of coxa vara following fractures of the femoral neck where the primary deformity has not been rectified by fixing the limb in extreme abduction. Unreduced Colles's fractures are also far too common.

Rotary displacement not uncommonly accompanies angular deformity in the femur and should then be corrected at the same time; rotation alone rarely requires correction in the lower limb. In the upper limb the most common and serious cases of rotary mal-union are found in the radius, the upper fragment being supinated while the lower is pronated. Uncomplicated cases of this deformity may be readily corrected by linear osteotomy of the radius above the insertion of the pronator radii teres and fixing the forearm in full supination, but it is frequently accompanied by angular displacement of the radial fragments towards the ulna which renders the case more difficult and necessitates further treatment.

Another example of rotary mal-union is furnished by a shoulder-joint which has ankylosed in a position of extreme external rotation. I have seen several such cases, following compound injuries of the upper end of the humerus, where the limb has been inappropriately fixed in a straight Thomas's splint. This condition may be satisfactorily treated by linear osteotomy of the humerus below the deltoid insertion.

Overlapping of the fragments constitutes a serious type of mal-union in a number of cases. In the lower limb it is a common deformity of the femur and may be associated with angular or rotary displacements. Slight degrees of shortening are readily counterbalanced by non-operative means, and in gross cases the accompanying contractures of the muscles will contra-indicate operation when the fracture is of long standing. Consequently it is of the utmost importance to restore full length to the bone during early treatment, and once the fracture is consolidated overlapping mal-union should not be disturbed. In the upper limb shortening is of little consequence and never requires operative intervention. Cross union or synostosis of the radial and ulnar shafts accounts for many cases of mal-union in the forearm. The condition is generally considered unfavourable but excellent results may be obtained provided the normal curvature of the radius has been preserved. After thorough removal of the bony bridge a fatty-fascial flap from the thigh is inserted between the bones, the flap is folded on itself so that the fascia lies in apposition with the bone on either side, and is then lightly sutured in place. When associated with angular or rotary mal-union of the radius cross union is less satisfactory and will require other methods of treatment.

Fractures of the articular ends, especially comminuted fractures, are frequently followed by mal-union. Apart from complete disorganisation of the joints in these cases, irregular or excessive callus or displaced comminuted fragments may interfere with joint function. Where the obstruction is extra-articular the condition can usually be remedied easily, but intra-articular cases are not favourable, though occasional successes may be achieved. Ankylosis of the superior and inferior radio-ulnar joints may be treated by excision of the heads of the radius and ulna respectively.

Non-Union.

In dealing with ununited fractures the first question to be decided is whether the condition present is one of delayed union or of true non-union. "Ununited fracture," says Jones,[4] "is often the result of surgical impatience," and "non-union would rarely occur if delayed union received proper attention." For delayed union operative treatment is unnecessary and the presence of non-union is to be determined by X ray examination. By this means atrophic and sclerotic types may be recognised, and when such changes are present in the bone non-union can only be remedied by operative measures.

BONE GRAFTING.

Although it is now more than a century since bone grafting was first successfully employed in surgery, its present popularity is due chiefly to the work of Albee, whose technical improvements have rendered accurate work possible and have greatly increased the scope of the method. It is, moreover, the only method available in dealing with cases in which a gap exists between the fragments if the original length of the bone is to be preserved, and it has therefore had a wide field of application in gunshot fractures, where loss of substance is a common feature.

In spite of the vast amount of work accomplished differences of opinion still exist on technical points.

but certain fundamental principles may be regarded as settled :—

1. The views of Macewen [5] on bone growth are generally accepted. He maintained that the periosteum was only a limiting vascular membrane without bone-forming properties and that osteogenesis was a function solely of the bone cell or osteoblast. These cells are present in greatest numbers beneath the periosteum and on the deep surface of the compact bone, and it is in these regions that bone growth and repair are most active.

2. All observers agree that living autogenous grafts are superior to any others.

3. Grafts should consist of the three elements—periosteum, compact bone, and medulla. The periosteum acts as a vascularising membrane and protects the underlying osteoblasts from injury ; the compact bone gives the graft mechanical strength but is almost devoid of osteogenetic power ; the endosteum is rapidly vascularised and takes an active share in osteogenesis.

4. Such grafts when contacted with living bone possess osteogenetic and osteoconductive properties ; the more favourable the conditions the more active will osteogenesis be. It is true that Murphy,[6] and more recently Gallie and Robertson,[7] denied osteogenetic properties and maintained that a graft always dies and acts only as a scaffolding, the bony tissue being gradually absorbed and replaced pari passu by new bone laid down by osteoblasts which invade the graft from the neighbouring host bone. But the evidence in favour of osteogenesis is strongly against the acceptance of this view.

5. Living autogenous bone grafts are capable of resisting *mild* degrees of infection.

6. Success in grafting is largely dependent on accurate coaptation, wide contact, and firm fixation between graft and recipient bone.

7. The growth of a graft is determined in accordance with Wolff's law, which states that changes in the form, position, or function of a bone are followed by corresponding changes in structure. As Murphy says, "The growth of a bone depends on the need for it."

While the value of bone grafting has been fully established it is acknowledged by all that failures have been common. In part these have been due to technical errors, but many of the cases are exceedingly difficult, and dense scar-tissue, muscular contractures, mal-alignment of the fragments, and latent sepsis are local conditions which may render success well-nigh impossible. For this reason a two-stage operation is often necessary. The first stage consists in excision of scar-tissue, freshening the ends of the bones, and correction of deformities, and is followed by a period of suitable splinting and massage. These measures greatly facilitate subsequent grafting and also provide a useful test for the presence of latent sepsis. If no "flare up" occurs grafting may be performed a few weeks later, but if suppuration has followed further operation should be postponed for a period of at least six months. Infection in grafting usually, though not invariably, spells failure, and no efforts should be spared to avoid it.

Two chief types of bone grafts have been employed : *Intramedullary* grafts, the ends of which are inserted into the medullary cavity of the fragments ; and *cortical* grafts, which are applied in such manner that corresponding layers of graft and host are in contact —periosteum with periosteum, cortex with cortex, and endosteum with endosteum. Intramedullary or "peg" grafts are attractive and possess certain advantages. They maintain accurate alignment of the fragments and require no additional means of fixation, but otherwise they are less satisfactory. They usually possess feeble osteogenetic power and many failures occur, either by lack of union between graft and host or by fracture or absorption of the graft which occurs frequently at the line of contact with one of the fragments. Failures are particularly common in the shafts of the radius and ulna where the medullary cavity is so small that it admits only a slender peg of compact bone almost devoid of osteogenetic properties. The mechanical advantages of the method, however, outweigh these objections in some cases, especially when dealing with a short fragment near the articular end of a bone.

In my experience better results are obtained by the use of cortical grafts, of which *sliding*, *inlay*, and *lateral* grafts are varieties. In suitable cases a massive lateral graft is, perhaps, the most satisfactory of all methods. The fractured ends are freshened laterally by longitudinal division, removing from one-third to one-half the thickness of each, so that the medullary canal is laid widely open and a large cortical graft is then applied. The graft is taken from the tibia, or in some cases it may be obtained conveniently from one of the fragments as a "sliding lateral" graft.

The grafts are usually fixed by means of stout catgut, kangaroo tendon, or silk. Wire sutures or ligatures may also be employed, but it has been my experience that in cases where stress is so great that fixation is difficult the means used is of little consequence, and failure generally follows by fracture or absorption of the graft. Grafts are most readily cut and the bones prepared by means of an Albee's motor saw. Theoretical objections to this method are not supported by practical experience, and by its use much time is saved and more accurate work is possible. Secure post-operative fixation is essential after bone grafting and is usually most satisfactorily obtained by means of plaster-of-Paris. Although the "taking" of a graft is probably determined within a few days, absolute fixation should be maintained for at least six weeks. After this period gentle massage and regulated movements of the muscles stimulate further osteogenesis and strengthening of the graft.

In simple fractures the results obtained by grafting are naturally far better than in the case of gunshot injuries and the method has been advocated extensively even for recent cases, but in my opinion bone grafting should find no place in the treatment of recent fractures and should be reserved for cases of non-union.

Overlapping and Impaction.

When no serious disability is entailed by shortening the limb non-union may be treated conveniently by other methods. Such cases will occur in the humerus and forearm, and in the femur or tibia of a patient who has previously suffered amputation of the other leg. For fractures of the shaft shortening by steppage or the "step-cut" operation is the method of choice. The ends of the bone are freshened on opposite sides in an L-shaped manner, and then secured by means of wire sutures. For fractures near the articular ends steppage is unsuitable and shortening by impaction is a better procedure. The ends are freshened transversely, and the narrower fragment is pointed and then impacted into the other. These methods yield excellent results and are generally followed by prompt union. In forearm cases both bones must be shortened together and then secured, but in the leg the fibula may be resected without fixation.

EXCISION.

Certain intra-articular fractures which are followed by non-union are successfully dealt with by excision of the loose fragment. Such cases occur in the shoulder-, elbow-, hip-, and knee-joints, and in these excision will usually be the method of choice.

In treating of fractures from an operative standpoint I trust that I have created no impression of disparagement of conservative methods. These constitute the routine treatment, and experience in recent years has but strengthened their position. Old principles have been justified, though methods and details have been modified and improved in many cases. Operative procedures occupy an important but subordinate place, and are properly employed to remedy the shortcomings and failures of non-operative measures.

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A NEW MERCURIAL FOR THE INTRAVENOUS TREATMENT OF SYPHILIS.

BY W. R. SNODGRASS, B.Sc., M.B., CH.B. GLASG.,

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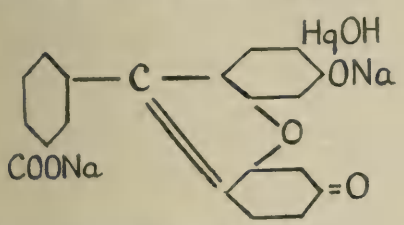
White, Hill, Moore, and Young, of Baltimore, have reported favourably on the clinical results of a new mercurial for the intravenous treatment of syphilis.[1] To this mercurial they have given the name "flumerin," and for it they claim a high therapeutic value, especially in experimental infections, along with a low toxicity.

According to Young and his co-workers flumerin is a reddish powder containing 33 per cent. of mercury in the non-ionised form. It is the disodium salt of hydroxymercuri fluorescin. The chemical formula is as follows:—



Flumerin is readily soluble in hot or cold water, and is antiseptic. Freshly-prepared solutions should be used, as after seven to ten days a sediment of metallic mercury appears. In a few instances where two to four day-old solutions were employed, no increase in the toxic effects were seen.

In the cases now under review the drug was used in a 2 per cent. solution, with a dosage ranging from 2 mg. up to 5 mg. per kilogramme of body-weight. In a few cases this dosage was exceeded. For adult males this entails a dosage which varies from 0·2 g. to 0·45 g. in each injection. Injections were usually given at bi-weekly intervals, and the average number of injections was ten. This corresponds approximately with the original method of administration. As a result of treating 25 cases of syphilis, certain definite observations have been made which would appear to justify the publication of a clinical note, and to encourage the further employment of the drug. Eight cases of secondary and 17 of tertiary syphilis were treated. The most interesting results

TABLE I.—*Summary of Results in Secondary Cases.*

—	No. of injections given.	Disappearance of lesions.	Clinical relapse during or after treatment.	W.R.[2] of blood at end of course.
Male				
1	12	Yes	Yes [1]	+
2	14	,,	,, [1]	+
3	11	,,	No	−
4	10	,,	,,	+
5	11	,,	,,	−
Female				
6	5	,,	,,	+
7	11	,,	,,	−
8	15	,,	,,	+

[1] The relapses noted occurred during treatment with flumerin.
[2] Those cases in which the W.R. was + were then treated with salvarsan with satisfactory serological result.

were obtained from those treated while in the secondary stage of infection, and these are considered firstly from the point of view of cure, clinical and serological, and secondly with reference to the toxic effect of the drug. Table I. summarises the results in the secondary cases.

[1] Jour. Amer. Med. Assoc., 1922, lxxix., 877.

All the cases shown in Table I. before treatment presented gross secondary lesions. In all the Wassermann reaction of the blood (W.R.) was positive, and in seven *Spirochæta pallida* was found. The most satisfactory result was the rapid disappearance of the clinical manifestations. In one case condylomata disappeared in seven days; in another mucous patches of the throat healed in seven days. In all but one case all staining from the various forms of rash present had disappeared before the eighth injection. Adenitis was the most persistent feature, but it too had yielded, with one exception, by the fifth week. The most disturbing clinical finding was the undoubted relapse of two cases while still under treatment and when apparently clinically cured. Case 1 showed a reappearance of condylomata after the twelfth injection of flumerin, although the original condylomata had healed in one week. No spirochætes were found in the relapsed lesions. In Case 2 a hard indurated sore appeared at a fresh site, and numerous spirochætes were obtained from it.

Only in three cases did the W.R. become negative, and in one of these, Case 3, the cerebro-spinal fluid showed a positive reaction. There were no nervous symptoms in this case. The cerebro-spinal fluid was not examined before treatment was started.

The changes in the W.R. do not compare unfavourably with those following the use of any other mercurial used over a similar period.

In order to amplify the presentation of the results of treatment, two cases are quoted in detail—the most favourable and the least so.

CASE 5.—Male, aged 31. Clinical examination on first appearance showed a healed chancre on right side of prepuce with considerable induration. A copious large papulo-squamous rash, with a few follicular spots, present over trunk, limbs, and forehead. A small mucous patch noted at the right angle of the mouth. Generalised adenitis present. W.R. positive. Injections were given at weekly intervals with the results noted in Table II.

TABLE II.

Grammes flumerin.	Rash.	Mucous patches.	Adenitis.	Induration of sore.	W.R. of blood.
0·20	—	—	—	—	+
0·25	Much faded	Dry	Less marked	—	+
0·30	Staining	Healed	Present	—	+
0·30	,,	—	Slight	Clear	+
0·30	Clear	—	Clear	—	+
0·35	—	—	—	—	+
0·35	—	—	—	—	+
0·30	—	—	—	—	+
0·20	—	—	—	—	−
0·20	—	—	—	—	..
0·25	—	—	—	—	..
0·25	—	—	—	—	−

No toxic effects were noted throughout. Patient has remained well, and serological reaction of blood and cerebro-spinal fluid was satisfactory three months after last injection.

CASE 1.—Male, aged 25. He presented an indurated sore on the frenum, small, shallow, and clean. Numerous

TABLE III.

Date in 1923.	Flumerin (g.)	Sore.	Condylomata and mucous patches.	Adenitis	Complications.	W.R. of blood.
17/4	0·35	—	—	—	S.V.D. 2 days	..
24/4	0·30	Healed	Dry	—	Sl. V. & D.	+
28/4	0·25	—	Healed	Less	—	..
1/5	0·25	Noind.	—	—	S.	Susp.
9/5	0·25	—	—	Clear	D. 1 day	..
15/5*	0·30	—	—	—	S.M., no ging.	+
22/5	0·35	—	—	—	D. 2 days	+
26/5	0·20	—	—	—	—	..
9/6	0·20	—	—	—	—	..
12/6	0·25	—	—	—	—	+
19/6	0·25	—	—	—	—	..

* *Pigmentation.*—Faint staining only.
Ind., induration. S.V.D., sickness, vomiting, diarrhœa. Sl., slight. S.M., sore mouth. Ging., gingivitis.

mucous patches over the scrotum and on the left side of the throat were seen. There were brown pigmented spots at the

flexures of groin and axilla. Florid anal condylomata were present. There was a marked general adenitis. W.R. positive. Spirochætes were found in the condylomata and mucous patches. Injections were given at variable intervals with results as shown in Table III.

On July 3rd, 1923, patient showed relapse of condylomata and adenitis. There were no spirochætes found. W.R. positive. There was an early gingivitis. Intravenous arsenical therapy was commenced with good results, both clinically and serologically.

Toxic Effects of Flumerin.

The toxic effects of the drug will be considered in conjunction with the series of tertiary cases. These numbered 17, and included subcutaneous gummata, skin lesions, ulcerative gummata, and Wassermann-fast patients with latent disease. All lesions disappeared under treatment with flumerin alone. The skin lesions were usually healed after about eight injections, though pigmentation persisted. The subcutaneous gummata and ulcerative lesions were slower in disappearing, ten injections being usually required. No clinical relapses occurred.

These results are good. Flumerin seems much more potent in its clinical effects than other mercurials. All workers must be familiar with the persistence of gummatous lesions under mercurial treatment alone. In one case of leukoplakia of the tongue treatment was interrupted after the tenth injection of flumerin on account of the development of a papilloma on the tongue. Histological examination showed this to be a simple tumour. The leukoplakia was not improved.

In no case was the W.R. changed from positive to negative. This is not surprising in view of the duration of treatment.

The toxic effects may now be considered. At the site of injection no ill-effect was seen. Toleration was complete in six out of the 25 cases. In five cases the complications which ensued were sufficiently severe to compel a change of treatment. In the remaining 14 cases marked reactions occurred, but it was possible to continue treatment with flumerin by carefully adjusting the dosage. The majority showed an improvement in toleration even of large injections of the drug. Sickness, headache, abdominal cramp, and diarrhœa were the chief complaints. Sickness was often immediate, and had some relation to the previous ingestion of food. A two-hours' preliminary fast is a necessity. At times vomiting followed, and lasted intermittently for 24 or, rarely, 48 hours. Headache and malaise were usually not marked. Cramp in the epigastrium and hypogastrium was the most striking complaint, and was obviously related to the excretion of the drug. After two out of a total of 280 injections it assumed alarming proportions. Diarrhœa for 24 or 48 hours was fairly frequent. The severer cases were accompanied by colic, and in three instances there was said to be the passage of blood. Pain in the mouth was occasionally mentioned. In three cases a mild gingivitis or stomatitis developed. The original workers record a number of cases of albuminuria. In the 25 now under review, renal efficiency was apparently fully maintained, and no albuminuria was found. One case calls for special notice.

A female, aged 31, with latent tertiary syphilis was given two injections of 0·20 g. and 0·25 g. one week intervening. These doses were well tolerated. She was then given 0·30 g. three days after the second injection. In eight hours she was seriously ill with colic, bloody diarrhœa, headache, and collapse. She recovered in four days under stimulant and eliminant treatment. Very small doses of flumerin were given again, but a threatened return of the symptoms compelled a change of treatment.

The age, sex, and general physical condition of the patients apparently gave no clue to their probable toleration of flumerin. The only rule for treatment is caution with the initial dose, and careful observation of its results. These toxic manifestations indicate a lesser or greater degree of acute mercurialism, and it is noteworthy therefore that no alteration in the output or character of the urine was seen. The drug is rapidly excreted, and it is considered that chronic mercurialism due to storage of the drug should be rare.

More perhaps has been made of the toxic effects than is justifiable. The vast majority of the injections were well borne, and the side-effects are no worse than those following any other intravenous mercurial. As the drug is a new one, each weak point in its use was minutely recorded, and the majority of the symptoms were elicited only after questioning the patient. Care is required in the use of flumerin, but it is not contra-indicated on account of its toxicity. Although the number of cases treated is small, certain definite observations have been made, and as further use of flumerin will be combined appropriately with arsenic or iodide—this being also the experience of the original workers—the following conclusions are suggested.

1. Gross secondary lesions show material alteration in the direction of healing within one week as a result of the administration of flumerin alone. No other mercurial preparation would appear to produce marked changes so rapidly.

2. The action is not lasting. Relapses in secondary cases may occur within a relatively short time or even while treatment by flumerin is being continued.

3. A positive W.R. is usually not altered to a negative one. In this respect flumerin does not compare unfavourably with an equivalent use of other mercurials given without salvarsan preparations.

4. Tertiary cases which present definite lesions show rapid clinical improvement with flumerin alone. The rapidity appears much greater than that produced by other mercurials, but less than by combined treatment by mercury and iodide. No effect upon the W.R. is noted. This is not significant in view of the duration of treatment.

5. Marked toxic effects of the nature of acute mercurialism were occasionally seen. Conversely cases of great toleration were noted. The reason for this is apparently not related to the patient's general physical condition.

6. Extended trial of flumerin should be made on account of its rapid antisyphilitic effect. This rapidity is its outstanding property. At the same time, even the restricted observations here recorded indicate clearly that the drug should be used along with salvarsan preparations or iodides, as the case demands.

The venereal diseases department is much indebted to Dr. H. H. Young, who placed at Prof. C. H. Browning's disposal a quantity of flumerin sufficient to treat 25 cases.

THE INCIDENCE OF KETOSIS IN CASUALTY PRACTICE.

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WITH a view to tracing, if possible, the incidence of ketosis in casualty cases, an investigation has been made of a number of patients of all ages admitted to the casualty ward of the above hospital during a period of ten months. No case was classed as ketosis which did not give positive chemical results on examination of the urine. The tests employed were Rothera's tests for acetone, and the ferric chloride test for aceto-acetic acid; while in doubtful cases in which salicylates had been given for the relief of pain Gunning's iodoform test was employed. (The tests are described at the end of the paper.)

In 393 cases examined only 11 had received general anæsthetics before examination for acetone; all of Class 1 and Class 3*b* were quite healthy until the time of admission, and about 30 per cent. of the other cases were similarly in perfect health until the day previous to their admission. The 36 cases not included in the above table consist of tumours removed and of adult circumcisions performed under local anæsthesia, and a number of cases admitted for observation and diagnosis, mostly of a medical

rather than a surgical character. None of these developed ketonuria.

Examination of the table shows that Class 2 (irritation of mucous membrane) has the largest percentage of cases of ketosis. The respiratory and alimentary systems are grouped together in this table because clinically, especially in the younger cases, acute irritation of one system was often associated with evidence of involvement of the other—e.g., an acute tonsillitis was found to be associated with pharyngitis, bronchitis, bronchiolitis, or gastritis.

Table of Cases Examined.

Class.	10 years and under.	10–20 years.	Over 20 years.	Total.	Percentages.
1. Trauma.					
(*a*) Head injuries—					
Total number	37	21	35	93	
Acetone present	32	12	7	51	55
(*b*) Other injuries—					
Total number	12	14	28	54	
Acetone present	11	5	9	25	46
2. Irritation of respiratory and gastro-intestinal tracts.					
(*a*) Respiratory tract chiefly—					
Total number	27	5	11	43	
Acetone present	23	3	2	28	65
(*b*) Intestinal chiefly—					
Total number	28	9	15	52	
Acetone present	15	8	4	27	52
3. Toxæmia.					
(*a*) Suppurations—					
Total number	27	19	42	88	
Acetone present	11	7	11	29	33
(*b*) Burns and scalds—					
Total number	18	2	7	27	
Acetone present	7	0	1	8	30

Total number of cases examined 393
Number of cases under 10 years.. 150
Total number of ketosis .. .. .. 168 = 43 %
Number of ketosis patients under 10 years .. .. .. 99 = 66 %

Note.—Seven of the intestinal cases under 10 years of age were too young for a specimen of urine to be obtained and are counted as negatives.

Sore Throat.

A large number of the cases brought to the casualty department for treatment for "sore throat" were found to have ketosis, in these there was a history of acute onset of sore throat and headache followed by drowsiness; vomiting was not usual; the mother in some cases had noticed a "sweetish smell" in the breath, and the urine showed the presence of acetone bodies. Only those cases, with five exceptions, which were admitted to the ward for treatment are included in the above table, hence the proportion of cases of this class treated as out-patients and who developed ketosis is not known. Most of the cases under ten years of age who were admitted had bronchial and pulmonary complications. One interesting case of this group was that of a woman, aged 35, admitted suffering from coma of unknown origin, and with a temperature of 102° F. Her urine was found to contain a large quantity of acetone bodies, but no other abnormal substance; sodium bicarbonate was given rectally and subcutaneously. The following day she was much better, and stated that the day before her illness she had a "very bad sore throat"; on examination her tonsils and pharyngeal mucous membrane were found to be very inflamed.

In the cases classed above in Class 2, group (*a*) (irritation of respiratory tract), it was found that the more severe the inflammation and the more rapid its onset the more marked was the ketosis. Also the younger the child the more did it appear to suffer from ketosis, as shown by the marked improvement clinically after alkali treatment, although the respiratory condition showed little or no improvement. This group would naturally include cases of tonsillectomy and adenoid curettage, but as such cases are subjected to general anæsthesia they have not been included in this series.

Irritation of Gastro-intestinal Tract.

Cases of irritation of the gastro-intestinal tract were found to fall into two sub-groups. The first sub-group (*a*) consists of those cases in which the irritation was present primarily in the lumen of the bowel, the initial picture being one of acute gastritis or gastro-enteritis. There was in most of these a definite history of dietetic indiscretion, or of the swallowing of an irritant poison, together with a gradual increase of abdominal discomfort followed by nausea and vomiting or diarrhœa. The patients were brought to hospital on account of the abdominal condition and of drowsiness, and all showed marked improvement on being treated with alkalis. One interesting case was watched from the commencement: A boy, aged 2½ years, had swallowed an unknown quantity of oil of eucalyptus; he was brought to hospital about half an hour afterwards, on the way he had vomited; his condition on arrival suggested severe shock. He was given an emetic and treatment for shock adopted. The drowsiness increased, and a specimen of urine obtained about five hours after admission showed the presence of acetone bodies. The child became more and more drowsy, but showed marked improvement upon the administration of alkalis. There was no vomiting apart from that occurring immediately after the drug was swallowed and that which resulted from the administration of the emetic; but there was marked tenderness over the epigastrium, and a mild diarrhœa commenced a few hours later. The ketosis lasted for two days after his recovery clinically.

The second sub-group (*b*) consists of cases in which the site of irritation was unknown; in some the irritation was probably due to abnormal contraction of the intestinal muscles. The initial picture in these cases was chiefly that of an "acute abdomen" accompanied by collapse, the patient having been quite well until the onset of severe abdominal pain. A typical case of this sub-group is the following. A girl, aged 11 years, was seized with an attack of severe abdominal pain while drilling at school; the child "doubled up" and "fainted," but did not vomit. On admission the temperature was 100° F., pulse 110, facies anxious and pale, pupils dilated, while she lay limply on the couch and looked very ill. The abdomen showed very little movement on respiration; there was no rigidity, but there was tenderness on the right side, particularly over the liver; the breath smelt strongly of acetone, and the urine contained acetone bodies. A few hours later ketosis was well marked, and alkali treatment cleared up the symptoms, while no further abdominal symptoms developed. Some patients of this group who had not vomited at the onset of the symptoms started vomiting as the ketosis developed; the vomiting became worse, and was accompanied by headache and marked drowsiness.

Trauma.

The cases included in Class 1 (trauma) have the next highest incidence of ketosis. These cases are divided into two groups, because in cases of head injury and concussion the symptoms of severe ketosis may lead to difficulty in diagnosing intracranial complications. The usual picture of cases of group (*a*) was the following. A child, 8 years old, was brought into hospital, very irritable, with bleeding from the nose or ear; there was a history of a head injury and unconsciousness lasting for some minutes. About five hours after admission the breath was noticed to smell of acetone and a specimen of urine obtained at this time showed traces of acetone bodies; a little later the child became very drowsy and started vomiting, and the acetone excreted increased in quantity. The child lay very limply in bed, with the face pale, and respiration chiefly of the costal type. When roused he was very irritable; vomiting was forcible, and was more marked when any attempt to swallow fluid was made. Treatment with alkali diminished and eventually cleared up the symptoms.

Several cases have been carefully watched from the time of admission, and in those where vomiting had not occurred at or soon after the time of the injury it did not commence until ketosis was definitely established. This in most children occurred about five hours after the injury, acetone being then easily detected in the breath. The vomiting and ketosis in mild cases pass off in two or three days without any treatment; but in cases of severe concussion the ketosis increases, the vomiting becomes more severe, and the child suffers from loss of fluid and exhaustion, unless alkali treatment is adopted. The vomiting and drowsiness occurring some hours after the head injury in children under 10 years of age appears to be due, in a large number of cases, more to ketosis than to any actual brain lesion; and the change in the condition of the child after alkali treatment is sometimes very surprising.

The following case is worthy of note. A boy, aged 2 years, was sent to the hospital in an apparently moribund condition as a case of possible intestinal obstruction; there was a history of severe vomiting for three days. The smell of acetone was well marked in the room in which the child was waiting; the child looked very ill, with the typical picture of severe acute ketosis. On physical examination there was nothing to account for the vomiting. The parents were carefully questioned, and stated that before the vomiting started the child had fallen from a chair on to its head and had been "very drowsy" for some time afterwards. Eight ounces of a mixture of isotonic glucose solution and potassium citrate were given subcutaneously, and sodium bicarbonate was administered by the mouth. The following morning the child was well on the path to recovery.

The cases of extracranial head injury which I examined did not develop ketosis; while in the cases of children under 10 years in which there was undoubted brain injury as evidenced by fits or spasticity a severe ketosis developed. It is interesting to note in this connexion that a large number of children develop severe ketosis after mastoid operations. Cases in group (*b*) (other injuries) include patients run over by vehicles, and work accidents and fractures. Three cases of traumatic pneumothorax in children under 10 years developed a severe ketosis within a few hours of their admission, and the relief of symptoms after alkali treatment was remarkable, the respiration becoming easier and the colour and general condition much better. Of the ketosis patients over 20 years of age, six were cases of chest injury.

Toxæmia.

The third class of case is divided into two groups: (*a*) cases of suppuration, (*b*) cases of burns and scalds. A large number of the first group of cases were of gradual onset. There was usually a history of malaise lasting for some days, a small scratch or injury which gradually formed a septic focus with local tissue destruction, and possibly a mild septicæmia. Only those cases which had a high temperature and severe toxic symptoms developed ketosis. The other cases were acute inflammatory conditions, with rapidly progressing cellulitis, lymphangitis, and marked severe general symptoms, while the onset was usually relatively very sudden. This condition occurred mainly in patients who, prior to the skin wound, were in apparently good health. All cases of this type examined showed a marked ketosis on admission.

The second group of this class consists of cases of burns and scalds. All those which developed a marked ketosis had also respiratory complications; cases which did not develop respiratory complications exhibited a mild ketosis or no evidence of acetone in the urine, although in a few cases the initial shock was severe. The ketosis cases under 10 years of age were kept under observation for some time after their discharge from hospital, and it was found that those patients who developed marked ketosis with well pronounced general symptoms suffered from general debility for a considerable time afterwards. In these cases the mother stated that the child was "fretty" and took no interest in life or in food, and the child appeared pale and listless for some weeks after discharge. Cases treated early with alkalies made a more rapid recovery.

The treatment adopted in cases of ketosis consisted in the administration of a purgative and of alkalies. An initial dose of 20 gr. sodium bicarbonate to children, 30 to 60 gr. to older patients, was given and repeated every two or four hours according to the condition of the patient. In most of the severe cases there was a well-marked improvement after the third dose. The patient was encouraged to drink plenty of fluids with glucose or lemon-juice. Prolonged administration of sodium bicarbonate was found to irritate the stomach in some instances, and citrate of potassium or of sodium, 20 to 30 gr., was used instead. In cases with severe vomiting 30 gr. sodium bicarbonate was given subcutaneously in a 5 per cent. solution of glucose or of citrate of sodium as well as by mouth. The doses were decreased as soon as the acute symptoms had passed off, and the patient was encouraged to eat carbohydrate and fruits. The urine in severe cases was found to contain acetone bodies for some days after the clinical condition had improved.

Suggested Conclusions.

The total number of cases examined is too small to allow any definite conclusions to be drawn; but the following are suggested. Cases of trauma, particularly head injuries, cases of acute irritation of the intestinal or respiratory mucous membrane, and cases of acute suppuration may be complicated by the onset of an acute severe ketosis; the younger the patient the greater is the possibility of this complication. This severe ketosis may aggravate and mask the symptoms due to the primary condition. The central nervous system, having no protection in itself against ketosis or acidæmia, suffers most, as is evidenced by the drowsiness, irritability, and headache.

Ketosis, if untreated, may lead to severe vomiting, may interfere with the patient's recovery, and may prolong the convalescence. In any case our knowledge of the central nervous system is so incomplete that the result of a temporary damage to the nerve cells by ketosis cannot be estimated; and the general debility, listlessness, and dread of mental strain seen in concussion cases of school age for months after the injury may be due to the results of ketosis rather than to a possible physical trauma at the time of injury.

Treatment consists in the administration of alkalies and aperients. In children prophylactic treatment with alkalies in cases of acute trauma and inflammatory conditions would diminish the occurrence of acute ketosis and would not cause any harm to the patient.

Tests for Acetone Bodies.

1. *Rothera's Test* (Modified).—Add ½ in. of a mixture of powdered crystals of ammonium sulphate, 20 parts, and sodium nitroprusside, 1 part, to a test-tube half full of urine, then add ½ in. of strong ammonia solution; shake well and allow to stand. A permanganate colour develops if acetone bodies are present.

2. *Ferric Chloride Test.*—Add liq. ferri perchlor. solution, drop by drop, to a test-tube half full of urine until no further precipitate of ferric phosphate is formed; further addition of the solution gives a Bordeaux-red colour if aceto-acetic acid or salicylates are present.

3. *Gunning's Iodoform Test.*—Add an alcoholic solution of iodine and a little strong ammonia to a test-tube half full of urine; a mixed precipitate of iodoform and black nitrogen iodide is formed if acetone is present; the black precipitate disappears, leaving the yellow precipitate of iodoform.

OBSERVATIONS ON CUTANEOUS HYPERÆSTHESIA IN ACUTE ABDOMINAL DISEASE.

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IT has long been known that acute abdominal disease may be accompanied by increased cutaneous sensibility, but the almost complete silence of the text-books on the subject is sufficient evidence that the value of such hyperæsthesia is either not recognised or is under-estimated. When reference is made to the subject the information afforded is often erroneous. For example, Blos[1] writes:—

When the pain triad has been present (skin-hyperæsthesia muscular defence, painful McBurney's spot) we have always found peritoneal suppuration. Especially skin-hyperæsthesia is of the greatest significance.

A very short series of observations would serve to show any accurate observer that cutaneous hyperæsthesia does not necessarily indicate suppuration. The attitude of most surgeons to the subject appears to be that of scepticism as to its value in diagnosis, and doubt as to any certain conclusions which may be drawn from its presence.

Historical.

More than 20 years ago Head [2] noted cutaneous tenderness over the right tenth dorsal segmental area in a case of strangulated femoral hernia containing small gut, and from many observations he came to the conclusion that the intestines might cause referred pain in the distribution of the tenth, eleventh, and twelfth dorsal segmental nerves. The first surgical observer who attempted to systematise our knowledge on the subject was Sherren,[3] whose classical paper on hyperalgesia in acute appendicitis has been grievously overlooked by the profession. Sherren investigated 124 cases of acute appendicitis and detected increase of cutaneous sensibility in 40 cases. He concluded that in appendicitis the hyperalgesia usually occupied the eleventh dorsal segmental area, sometimes encroaching on the tenth or twelfth dorsal areas. I will quote his words:—

In appendicitis cutaneous hyperalgesia varies from a complete band extending on the right side from the middle line below the umbilicus in front to the lumbar spines behind, down to a small circular spot a little above the middle point between the umbilicus and the anterior superior spine. This band corresponds to the eleventh dorsal area of Head. Very often the tenderness extends somewhat into the tenth dorsal area also, and occasionally but not often into the twelfth dorsal area, sending a tongue-shaped process over the gluteal region. The width of the band is in the adult about 3 inches. The normal area is on the right side of the abdomen and is of a triangular shape. Its lower boundary reaches almost to Poupart's ligament, its inner almost to the middle line, and its apex is a little outside the anterior superior spine, sometimes extending to the mid-axillary line.

Cutaneous tenderness in appendicitis is occasionally bilateral. I have never yet seen a case in which the hyperalgesia was present on the left side alone. In the gangrenous type of the disease no such tenderness can be discovered when the patient comes under observation. If a patient is progressing favourably the hyperalgesia clears as the symptoms of the disease improve, rarely persisting in the first attack after the sixth or seventh day.

Mr. Sherren believed that distension of the appendix was the main cause of the hyperalgesia, and concluded that sudden loss of the symptom, provided that the other symptoms remained, indicated perforation of the appendix. In cases of appendicular abscess he found only 10 per cent. exhibited hyperalgesia. His observations led him to conclude that increased cutaneous sensibility was not found in other diseases of the intestines. Further observations on the same lines were carried out by H. Robinson,[4] who investigated 200 cases of acute abdominal disease. In 123 cases of acute appendicitis Robinson found hyperalgesia in 26 cases. The areas involved corresponded for the most part to those described by Sherren, but Robinson differed from Sherren in concluding that—

(*a*) Other diseases can give rise to hypersensitive areas somewhat similar to those caused by appendicitis.

(*b*) In some cases at least tension within the appendix cannot be the exciting cause.

(*c*) The symptom is present in cases of appendicular abscess in only a slightly lower percentage of cases than those cases without abscess.

Robinson found cutaneous abdominal hyperæsthesia in one case of perforated ulcer, in three cases of gall-stones and cholecystitis, in two cases of perimetritis, and in one case of intestinal colic. Since the publication of Robinson's paper little work appears to have been done on the subject, though Ligat [5] published some observations which so far as I am aware have not been confirmed by others. My own conclusions are based on nearly 300 cases, and they confirm, modify, and extend the observations of Sherren and Robinson.

Methods of Testing for Hyperæsthesia.

There are two simple methods of testing for hyperæsthesia—the pin-stroke and the light pinch. The pin-stroke consists in drawing the point of a pin lightly across the surface of the skin of the abdomen from the costal margin down to Poupart's ligament. This should be done on both sides in several places working from the mid-line outwards. The patient is asked to indicate if at any part of the stroke the sensation varies, or feels sharper, or causes pain. To find the exact lower limit of any area of increased sensibility it is wise to draw the pin from below upward, for it is easier for the patient to feel an increase than a decrease of sensibility. One is occasionally astonished to find that there is a definite hyperæsthesia when the pin is drawn from above downwards, but none detectable when the stroke is in the reverse direction. To discriminate between the sensitiveness of the two sides of the body it is necessary to draw the pin lightly across from one to the other side of the mid-line.

Several small details must be attended to if an accurate result is to be obtained by the pin-stroke. The point of the pin must be held at the same angle to the skin all through the stroke. It is very easy (especially if the clothes or bed-clothes are not well out of the way) to finish the stroke on the lower abdomen with the pin at an angle approaching the vertical instead of the suitable angle of about 30°. This would cause a natural increase in the patient's sensation. In one case showing hyperæsthesia when I had been careful to keep the pin at the same inclination to the skin the patient remarked when the hypersensitive area was reached that it felt as if the pin had been raised more to the vertical.

At the first trial the patient may not say quickly enough when the increase in sensation occurs. If therefore any positive result be obtained it is wise to perform the test again much more slowly so as to obtain the exact limit of the affected area. Care must also be taken that the pin used has not a bent end which may scratch and vitiate the test. (Any light object could be used for the test, but a pin is the most handy object and the point affords an extremely delicate indication of sensibility.) The amount of pressure used should be very slight and uniform all through the stroke. In patients with very brisk abdominal reflexes the pin should be specially steadied by the forefinger. The sensation caused by the stroke should only just be perceptible to the patient on normal areas.

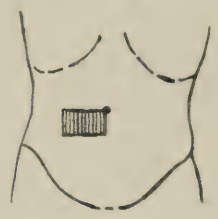
The pinch test needs little explanation. Corresponding portions of skin on each side of the middle line are gently pinched between finger and thumb and the patient asked if there be any difference in the sensation. Different areas on the same side of the body are similarly compared and any difference noted. As a rule, the abnormal areas found by one of these tests will tally with those found by the other, but occasionally one method succeeds where the other fails, or the areas affected may not be equal in extent.

In two cases I found hyperæsthesia to pinch and none to pin-stroke, whilst in two others the area hypersensitive to pin-stroke was considerably less than that due to pinch.

The cases I have investigated form a consecutive series seen during the course of 30 months. I have excluded from the list almost all the strangulated

FIG. 1.

FIG. 2.



Hyperæsthetic areas caused by appendicitis.

external herniæ since I have found practically all these cases negative. All the cases quoted were examined by me and (with very few exceptions) all the operations were undertaken by me.

Frequency of Occurrence of Hyperæsthesia.

Before estimating the frequency of occurrence of increased cutaneous sensibility it is necessary to distinguish between the terms hyperalgesia and hyperæsthesia. By hyperalgesia should be understood that state in which pain is felt on stroking the affected area lightly, whilst by hyperæsthesia one indicates a state of increased sensitiveness not necessarily causing pain on touching gently. It suffices for the patient to say that he feels a little more sharply over the affected area. Sherren detected hyperalgesia in only 32·3 per cent., whilst Robinson found hyperalgesia in only 21 per cent. of his cases of appendicitis. In my own series I found some area of hyperæsthesia in 59 per cent. of cases of appendicitis, and in 47 per cent. of all cases coming under the general category of the acute abdomen. Robinson only found hyperalgesia in about 16 per cent. of all acute abdominal cases. There is thus a great discrepancy between the figures of former observers and my own. The only feasible explanation of this is that both Sherren and Robinson took the elicitation of pain as the criterion of increased sensibility, whilst I searched for any slight exaltation of sensitiveness. I tell the patient to say at once if there is any increase of sharpness, whereas Robinson writes :—

> It is advisable to start at some distance from the usual seats of tenderness and thence to advance gradually towards the appendix region until the patient complains of a sensation of pain.

It is clear that the value of the test is greatly enhanced by taking a criterion which gives a positive result in so much greater a proportion of cases—provided, of course, that the criterion is of value. This I hope to show in this communication.

What Cases of Acute Abdominal Disease may present Cutaneous Hyperæsthesia as a Symptom?—I have found hyperæsthesia in a varying proportion of cases of acute appendicitis, perforated gastric or duodenal ulcer, cholecystitis and gall-stones, primary peritonitis, salpingitis with pelvic peritonitis, acute tuberculous peritonitis, ovarian cyst with twisted pedicle, renal colic, pyelitis, abscess of the spermatic cord, intestinal obstruction, and acute dysentery. I propose to consider first the types of hyperæsthesia associated with each of these conditions, and then to discuss certain problems which arise from the facts set forth.

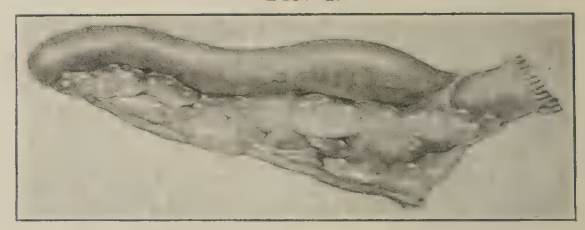
Acute Appendicitis.

Hyperæsthesia of greater or less extent was found in over 59 per cent. of cases of acute appendicitis (110 out of 185). Though perhaps more common with an unperforated distended appendix it was quite frequently found with a gangrenous or ruptured appendix or an undistended unperforated viscus. Abscesses in the first few days of their formation were also frequently accompanied by hyperæsthesia of more limited extent. The position and extent of the hyperæsthesia varied greatly. In nearly all the cases it was limited to the right side of the abdomen, but in eight cases it was bilateral, though not usually so extensive on the left side as on the right. In one case only was the area of increased sensibility confined to the left side. In the great majority of cases the part affected was somewhere within an area bounded below by Poupart's ligament and above by a line drawn outwards horizontally from the umbilicus. In only a very small percentage did the area extend above the level of the umbilicus or below the level of the groin.

FIG. 3.

Hyperæsthetic band corresponding to tenth dorsal segment, caused by appendicitis.

FIG. 4.



Appendix which caused hyperæsthetic band shown in Fig. 3.

Usually only the anterior part of the abdominal wall was involved. When a complete half-girdle band was present it was in the form of a zone 2 inches broad, the upper limit forming a line which extended out from the level of the navel. This corresponds to the area usually looked on as the tenth dorsal segmental area (see Fig. 3).

The so-called appendix-triangle (Sherren) (see Fig. 5 a) was found in about one-fifth of the cases

FIG. 5.

a — Dec. 21st.*
b — Dec. 29th.
c — Dec. 31st.

* Before operation and several days after.

Showing persisting hyperæsthesia after removal of appendix.

showing hyperæsthesia. It was sometimes found with a perforated or gangrenous appendix, but more commonly with an unperforated distended appendix. The typical triangle had as its boundaries the middle line, Poupart's ligament, and a line drawn outwards horizontally or slightly obliquely upwards from the umbilicus. It ended in a blunt angle just above and external to the anterior superior spine. Sometimes there was also a less marked hypersensitive triangle on the left side of the abdomen, and in one case the hypersensitive area was confined to a triangle on the left side. Complete triangles were the exception. In most cases only the lower or medial parts of the area

were hypersensitive. Very seldom, indeed, was the outer portion of the triangle alone affected. When such happened there was usually an abscess close under the affected part of the abdominal wall. There were many variations in the hypersensitive areas, some of which are here illustrated (see Figs. 1, 2, 3, and 5 a).

Speaking generally, the areas nearly always occupied some part of the region supplied by the tenth, eleventh, and twelfth dorsal segments of the spinal cord. So far as one could ascertain in the 110 cases showing hyperæsthesia, the twelfth segmental area was involved in 66 cases, the eleventh in 62 cases, and the tenth in 56 instances. There were four cases in which the sensitive area spread up to the ninth segmental area, and four cases showing hyperæsthesia in the upper part of the thigh below Poupart, presumably the first lumbar area.

The position of the appendix made no difference to the position or the extent of the hyperæsthesia. Whether the vermiform process was in the pelvis or high up under the liver the superficial tenderness was always in the lower abdomen. As will be noted later, inflammation of the gall-bladder may be accompanied by a band of hyperæsthesia just above the fold of the right groin (twelfth dorsal), but this band seldom invades the eleventh and never the tenth segmental area. The point is useful in diagnosis, as was illustrated in the case (No. 227) of a lad with acute abdominal symptoms and a history suggestive of appendicitis, who presented tenderness on deep pressure only in the right hypochondrium close under the rib margin. There was no tenderness on pressure in the right iliac region, but definite hyperæsthesia over an area just below and to the right of the navel. Diagnosis of appendicitis was confirmed at operation when a perforated appendix was removed from its position high up under the liver in the angle between that viscus and the posterior abdominal wall.

I mentioned above that the hyperæsthesia was seldom found posteriorly. It was demonstrated in that position in but 13 cases. Five of these corresponded to the tenth segment only, two to the eleventh, whilst three extended just above and below the posterior part of the iliac crest. The remainder showed hyperæsthesia extending from the last rib to the iliac crest. I have not yet seen a case of appendicitis presenting hyperæsthesia only posteriorly.

Perforated Gastric and Duodenal Ulcers.

Contrary to what one might expect, the great irritation of the peritoneum consequent on the perforation of a gastric or duodenal ulcer is not usually accompanied by hyperæsthesia of the overlying skin. In a recent series of 19 consecutive cases, I only found six which showed this symptom in any degree. One of these had a simultaneous inflammation of the appendix and should not be included since the iliac triangle of hyperæsthesia had disappeared the day after the removal of the appendix and suture of the duodenal ulcer. The other five cases were as follows:—

CASE 172 showed an area of hyperæsthesia corresponding to the lower and inner part of the right iliac triangle. Operation revealed free bile in the peritoneal cavity and a duodenal ulcer which, though sealed up, had clearly allowed the leakage.

CASE 190, in which there was a large perforation of a duodenal ulcer, showed a broad band of hyperæsthesia above the right Poupart's ligament. Within a week after suture of the ulcer the hyperæsthesia had completely disappeared.

CASE 203 was that of a duodenal ulcer, which leaked into the right subphrenic space. When seen by Dr. W. L. MacCormac soon after the onset of the acute pain there was hyperæsthesia over the whole of the lower costal region on both sides. When I saw the patient four days later there was no hyperæsthesia.

CASE 242 showed a hyperæsthetic band above the right Poupart's ligament. Operation revealed a perforation of the first part of the duodenum.

CASE 277 was that of a perforation into the general peritoneal cavity of an ulcer on the anterior wall of the stomach. Before operation pin-stroke demonstrated a narrow band of hyperæsthesia (above an inch broad) above each Poupart's ligament.

It will be noted that in all but one of these cases the hyperæsthesia was just above Poupart's ligament corresponding to part of the twelfth dorsal segmental area. I have never seen the tenth segmental area affected with a perforated ulcer of the stomach or duodenum. The hyperæsthesia in the case of the acute subphrenic abscess was probably due to direct stimulation of the lower intercostal nerves.

Cholecystitis and Gall-stones.

Amongst the 16 cases of acute disease of the biliary tract which were investigated hyperæsthesia was demonstrated in but six cases. They were as follows:

CASE 153.—A woman, aged 67, with hyperæsthesia on the right side of the abdomen forming a band between two and three inches broad immediately above Poupart's ligament. Operation revealed an acutely inflamed gall-bladder and many gall-stones.

CASE 53.—A woman with right-sided abdominal pain was found to have a broad band of hyperæsthesia above the right Poupart's ligament and crest of the ilium, back as far as the outer border of the erector spinæ. At operation the retro-peritoneal tissues from the gall-bladder down to Poupart's ligament were infiltrated with bile which glittered with cholesterin crystals. No rupture of the gall-bladder was detected. A stone was removed from the gall-bladder, which was drained. This patient died ten days later, but no autopsy was obtained.

CASE 198.—A woman, aged 37, had severe colic, and presented symptoms suggestive of cholecystitis. There was slight hyperæsthesia to pin-stroke over the tenth rib posteriorly. At operation there was a stone impacted in the cystic duct, some cholecystitis but no contiguous peritonitis.

CASE 126.—A woman, aged 58, exhibited a patch of hyperæsthesia (to pinch only) just below and to the right of the umbilicus. At operation an inflamed gall-bladder was found in contact with the parietes immediately under the area indicated.

CASE 256.—A man, aged 43, presented symptoms of acute cholecystitis. He showed an area of hyperæsthesia above and to the right of the navel, corresponding to the anterior part of the ninth dorsal segmental area. At operation the gall-bladder was found very inflamed, and there were patches of gangrene in its walls. There was a stone in the entrance to the cystic duct.

CASE 176 was that of a woman aged 32, who suffered from acute right-sided abdominal pain, and showed a band of hyperæsthesia two inches broad immediately above the outer half of Poupart's ligament and the anterior two inches of the iliac crest. At the operation there was free bile in the peritoneum, and bile infiltration of the posterior parietal peritoneum to the right of the descending portion of the duodenum. There was no ulcer of the duodenum nor perforation of the gall-bladder, and no gall-stones were found.

It will be seen that in gall-bladder disease hyperæsthesia may be detected either in the ninth segmental area, which is the segment usually regarded as the source of the nerve-supply of the viscus, or the twelfth segmental area above Poupart's ligament. The only case in which the tenth segmental area was involved was clearly due to the direct irritation of the parietes by the subjacent inflamed gall-bladder. It is quite conceivable that both the upper and the lower areas might be simultaneously involved in a case, but so far I have never seen such an occurrence. It is worthy of note that in all the cases showing supra-Poupart hyperæsthesia there was right-sided peritonitis spreading down to the iliac fossa. It is reasonable to suggest that such peritonitis may have been the cause of the superficial hyperæsthesia, since the gall-bladder is not directly supplied by any fibres from the last two dorsal segments.

Primary Peritonitis.

By primary peritonitis is meant that form in which there is no sign of extension from a viscus either by perforation or contiguity. In the series of cases examined there was one staphylococcal infection, two cases of acute tuberculous peritonitis, and one case from which no organism was recovered. Each one of these cases showed extensive hyperæsthesia.

CASE 107.—A lad, aged 16, who had had acute abdominal symptoms for six days, presented a tender and rigid lower abdomen, with extensive hyperæsthesia reaching from the mid-line in front to the vertebral spines behind. In front the affected area was limited above by a line drawn obliquely outward and upward from the umbilicus, whilst posteriorly it

reached to the last rib and first lumbar spine. The lower limit was formed by Poupart's ligament and the iliac crest. Operation revealed extensive peritonitis, congested intestines, œdematous parietal peritoneum, flakes of lymph on the intestines, and a collection of fluid in the pelvis. The appendix was not so inflamed as the rest of the intestines. Staphylococci were grown from the peritoneal exudate. The hyperæsthesia gradually disappeared as convalescence proceeded.

CASE 221.—A lad, aged 13, with acute abdominal symptoms presented extensive hyperæsthesia on both sides of the body, limited below by Poupart's ligament and the iliac crest and above by a line drawn out from the navel back to the spine. Operation demonstrated free serous fluid in the peritoneal cavity and an extensive peritonitis. The appendix showed slight catarrhal inflammation and contained some thread-worms, but the inflammation was of too slight a nature to be responsible for the peritoneal condition. No growth was made from the peritoneal effusion.

CASE 137.—Acute tuberculous peritonitis. A lad, aged 13, who suffered from diarrhœa and vague abdominal pains for three days, suddenly developed right iliac pain. Temp., 103° F.; resp., 26 | pulse, 110. There was extensive bilateral hyperæsthesia in front only, extending from an inch or two above the navel down to Poupart's ligament. For an inch or two above Poupart's ligament on the right side a light pin-stroke caused him to catch his breath and cry out with pain—i.e., true hyperalgesia. At the operation acute miliary tuberculosis of the peritoneum was found. The cæcum and end of the ileum were very inflamed, matted together, and adherent to the posterior parietes in the right iliac fossa. The hyperæsthesia gradually disappeared. In a fortnight the formerly hyperalgesic area was still hyperæsthetic, whilst the rest of the area was normal.

CASE 164.—Acute tuberculous peritonitis. A young woman, who gave a history of one week's abdominal pain, presented on examination a tenderness in the right iliac fossa and hyperæsthesia reaching from just above the umbilicus to Poupart's ligament on each side. Operation proved the cause of the condition to be tuberculous peritonitis with loculated ascitic fluid, but no adhesions of the gut to the parietes.

Acute Intestinal Obstruction.

In the series of cases under review there were 25 cases of intestinal obstruction. These comprised 8 intussusceptions, 3 volvuli, 7 obstructive bands, 2 cancers of the colon, 2 cases of obstruction of small gut by a gall-stone, 1 stricture of the small gut, and 2 cases of strangulated ventral or internal hernia. Six of the intussusceptions occurred in babies in whom hyperæsthesia is not demonstrable. On no occasion did I find hyperæsthesia present with volvulus, obturation of the intestine, strangulated hernia, or stricture of the small or large gut. In the four cases which did exhibit some hyperæsthesia there was in each case some peritoneal irritation. The positive findings occurred in three cases of obstruction by bands and one recurrent intussusception.

CASE 109.—A youth, who gave a history of repeated attacks of abdominal pain and vomiting, was seized with a very acute paroxysm of pain. Within a few hours a large lump was felt in the left side of the abdomen. There was no cutaneous hyperæsthesia. Operation showed an enormous intussusception of the small intestine filling the whole of the pelvis and left iliac fossa. This was reduced fairly easily. A fortnight later a similar attack occurred, and a lump again felt in much the same position. Over the palpable lump in the left iliac and umbilical region there was on this occasion definite hyperæsthesia. On opening the abdomen it was found that the intussusception had recurred, but this time there was a great deal of adhesive non-suppurative peritonitis around the tumour formed by the invaginated bowel. Reduction was effected with some difficulty.

CASE 224.—A middle-aged man suffered from traumatic rupture of the small gut which was successfully sutured by Dr. MacCormac at St. James's Hospital. A fortnight later he had severe abdominal pain and vomiting, and there was on examination a complete right iliac triangle of hyperæsthesia. At operation I found adhesive non-purulent peritonitis in the right iliac region. The appendix was adherent to the anterior abdominal wall but was not inflamed. Obstruction had been caused by some omental bands. The adhesive peritonitis was presumably the result of a latent infection due to the intestinal rupture.

CASE 248.—A lad, aged 10, who had been operated on for tuberculous peritonitis ten months previously, was seized with acute abdominal pain of a spasmodic nature. He vomited twice. There was an area of hyperæsthesia just below and to the left of the navel, corresponding to the anterior end of the tenth segment. Operation revealed about 5 feet of purplish gut strangled by a band, which was easily divided. The hyperæsthesia gradually disappeared in the course of a few days.

CASE 201.—A lad, aged 14, who had had his appendix removed for acute inflammation nine months previously, was admitted to St. Mary's with a history of two days' pain and vomiting. Bowels not open. There was extensive hyperæsthesia anteriorly from the level of the umbilicus down to Poupart on both sides—i.e., a double iliac triangle. I diagnosed intestinal obstruction due to adhesions and accompanied by irritative adhesive peritonitis. On opening the abdomen I found the end of the ileum bound down and obstructed by soft fleshy adhesions, which fixed it in the region of the appendical stump. Free fluid was present, and the whole of the right iliac region and the ileo-cæcal part of the intestines and adjacent mesentery were inflamed. The obstructing bands were broken, and the raw surfaces invaginated by sutures. Two days later the hyperæsthesia was but a band 2 inches wide above Poupart on each side. In three more days the skin sensation was normal.

From these cases it is legitimate to conclude that intestinal obstruction is not commonly accompanied by hyperæsthesia of the skin, that when it is so accompanied there is usually considerable irritation of the peritoneum, if not adhesive peritonitis, and that the area which becomes hyperæsthetic lies within one or other of the iliac triangles. In Case 248 the strangled coil of gut had a smooth peritoneal coat, and though there was much free fluid there was no adhesive peritonitis. In this case it is quite possible that a direct stimulation of the mesentery might have produced the hyperæsthesia.

Salpingitis.—Of the four cases of salpingitis (accompanied as usual by a certain amount of pelvic peritonitis) only two showed any hyperæsthesia.

CASE 91.—A woman, aged 30, who had for some days had pain on micturition, developed pain in the right iliac region and vomited. When examined there was a triangle of hyperæsthesia in the right iliac region, but the upper level of the triangle did not quite reach to the level of the umbilicus. At the operation there was much clear fluid in the pelvis, and though the vermiform appendix was œdematous the focus of inflammation was clearly the Fallopian tube.

CASE 155.—A young woman, who gave a history rather suggestive of appendicitis, exhibited a right iliac triangle of hyperæsthesia. Operation showed no inflammation of the appendix, but pelvic peritonitis and acute tubal inflammation.

Inflamed Ovarian Cyst.—Both cases observed showed a small area of hyperæsthesia.

CASE 184, in which a large ovarian cyst was found twisted thrice on its pedicle, showed a small circular area hypersensitive to pinstroke and pinch midway between the umbilicus and the anterior spine. The appendix was not inflamed.

CASE 58.—A woman, aged 31, presenting symptoms resembling those of acute appendicitis, was found to possess hyperæsthesia over an area midway between the twelfth rib and the iliac crest on the right side posteriorly. Operation showed the appendix somewhat inflamed externally, but not within. Though the Fallopian tubes were not inflamed there was pelvic peritonitis round the right ovary, which was thrice its normal size, and contained a blood-cyst which burst on manipulation. One cannot draw any conclusions from such slight data.

Renal Cases.—Two cases of renal colic showed extensive hyperæsthesia.

In Case 76 the right tenth, eleventh, and twelfth dorsal segmental areas were affected.

In Case 94 the eighth and ninth segments were also involved. Since neither of these cases were operated on one hesitates to draw any dogmatic conclusion.

In Case 279, where pyelitis and cystitis were present, there were symmetrical bands of hyperæsthesia about 2 inches broad above Poupart's ligament.

Abscess of the Spermatic Cord.

CASE 171 was interesting from the point of view of parietal inflammation causing superficial hyperæsthesia. A man, aged 34, who had had an operation for right inguinal hernia nine years previously, developed a tender swelling under the scar of the operation. He presented hyperæsthesia over the lower and inner part of the right iliac triangle extending over Poupart into the upper part of the right thigh. At operation the appendix was normal, but there was a large inflammatory mass in the position of the intra-abdominal part of the spermatic cord. This proved to be an abscess with very thick walls.

General Remarks.

From the foregoing account it is clear that in cutaneous hyperæsthesia we have an important means of assistance in diagnosis of acute abdominal disease. Since various disorders are accompanied by similar hyperæsthesia it follows that increased cutaneous sensibility must not be taken by itself to prove the existence of any particular lesion. All the symptoms must be considered together before arriving at a diagnosis. Nevertheless, in acute disorders this particular symptom can almost always be taken as signifying inflammation or irritation of a viscus or of some part of the peritoneum.

The extent of the hyperæsthesia bears no direct or constant ratio to the extent of the lesion. General peritonitis may be entirely unaccompanied by cutaneous hyperæsthesia, whilst appendicitis without any peritonitis may cause widespread bilateral cutaneous manifestations. Patients who have a reflexly active or hypersensitive nervous system are more likely to exhibit extensive hyperæsthesia. Occasionally mental shock may have an influence, as in the following:—

CASE 7.—A lad, aged 19 years, who had been prepared for operation on the mastoid antrum, was seized with acute generalised abdominal pain whilst waiting to be taken to the operating theatre. His abdominal wall was rigid all over, and there was tenderness and hyperæsthesia over the whole abdominal area, and extending on to the lower thorax. Operation showed no peritonitis, but there was an unperforated, unadherent, catarrhally inflamed appendix containing a soft concretion. There can be little doubt that the extensive rigidity and hyperæsthesia were largely the result of the mental state of a patient expecting the operation with trepidation.

I have seen the same extensive hyperæsthesia in a patient who was proved later to be hysterical. Hyperæsthesia is usually more definite and extensive in young adolescents. In acute appendicitis it is common to find an iliac triangle of hyperæsthesia in young people between the ages of 10 and 25, rather uncommon between 30 and 40, and decidedly rare after the age 40. This is but what one would expect, for the nervous system becomes less excitable as middle age approaches.

How Long Does the Hyperæsthesia Last?

Sometimes removal of the cause, such as a diseased appendix, may lead to an almost immediate disappearance of the hyperæsthesia, but quite frequently the skin only gradually returns to normal.

CASE 120.—A girl, aged 16, exhibited a complete iliac triangle of hyperæsthesia on the right side when I examined her before operation on Dec. 21st, 1921. (See Fig. 5.) On that day I removed a distended and inflamed appendix containing a concretion and showing ulceration. On the 23rd the area of hypersensitiveness had not diminished. On the 29th it had been reduced to a band about 2 inches broad above the right Poupart's ligament. On the 31st the band was only about 1 inch broad. On Jan. 3rd the hyperæsthesia had disappeared.

The delay in the disappearance of the hyperæsthesia may be of importance in diagnosis, for it may be the last symptom remaining at the time the case is examined. When a patient complains of a recent attack of abdominal pain suggestive of appendicitis, even though all the other symptoms and signs may have disappeared, the presence of increased cutaneous sensibility in the right iliac region may be almost certain evidence of subsiding appendicitis. Few cases show any abnormal skin-sensibility for more than a week after the removal of the appendix or any other cause, but I have known a fortnight pass before the normal state was resumed.

Right-sided Hyperæsthesia.

In 122 out of 136 cases showing hyperæsthesia the left side of the abdomen was normal. In one case hyperæsthesia was only to be detected on the left side, whilst in 15 cases hypersensitiveness was noted on both sides, but was more marked and extensive on the right side. Common experience informs us that there is little, if any, difference as to the normal tactile sensibility between one side and the other, and there is little reason to suppose that the viscera are only represented on the left side of the brain. Yet the great preponderance of cases showing right-sided hyperæsthesia makes it clear either that the afferent fibres from the affected viscera causing the symptom are more closely associated with the fibres from the right side of the abdominal wall or that there is some other factor which decides that the right side shall be more sensitive. Such a factor may reasonably be found in the irritation of the parietal peritoneum on the right side. In the majority of cases showing right-sided hyperæsthesia there is a right-sided peritonitis, indicated by œdema of the parietal peritoneum and serous or other effusion within the peritoneal cavity. By far the majority of cases of peritonitis are due to a right-sided abdominal lesion. It seems reasonable to conclude therefore that irritation of the parietal peritoneum may in many cases determine the presence of right-sided hyperæsthesia.

Hyperæsthesia in the Lower Abdomen with an Upper Abdominal Lesion.

The occasional presence of a hypersensitive area just above Poupart's ligament in the case of acute disease of an upper abdominal viscus (cholecystitis, perforation of a gastric ulcer) is likely to mislead unless a reasonable explanation be forthcoming. A plausible explanation suggests itself when one records the fact that in every disease of the upper abdomen which is accompanied by hyperæsthesia below the umbilicus there is to be found peritoneal irritation or retro-peritoneal inflammation extending down to the iliac fossa and sometimes to the pelvis. The affected area in these cases is usually a narrow band corresponding to the twelfth dorsal segmental distribution, and this might easily be produced by irritation in the iliac fossa where fibres of the twelfth dorsal may be distributed. The involvement of the tenth dorsal area has almost always signified extensive hypogastric peritonitis or appendicular inflammation without peritonitis.

The Nerve-supply of the Appendix Vermiformis.

Some evidence is furnished by the cases examined to show that the appendix is supplied mainly by the tenth dorsal segment and slightly from the eleventh and twelfth dorsal segments. That evidence can be summarised as follows:—

1. Whenever in a case of appendicitis there was a complete band of hyperæsthesia, extending from the middle line in front to the spinal column behind, that band always occupied the tenth segmental area on the right side. I have never yet seen a complete band corresponding only to the eleventh or to the twelfth areas in appendicitis.

2. I have seen two cases of extensive peritonitis due to appendicitis in which the whole tenth segmental area was hyperæsthetic on the right side, but the eleventh and twelfth areas were only involved anteriorly. No case of peritonitis from other causes ever showed the tenth band distinct in this way.

3. That the tenth segment is the main source of supply is suggested by the fact that there is usually a sharp line of demarcation between the ninth segmental area and the tenth on stroking from above down, whilst on stroking from below upwards the patient may not readily detect any change of sensibility—i.e., there is a more gradual threshold from below upwards, but a sudden threshold from above downwards. This would seem to be in keeping with a diminishing nerve-supply for the appendix from the tenth to the twelfth segments.

4. It is not at all uncommon in the male for testicular pain to be felt at the onset or during the course of an attack of acute appendicitis. The tenth segment is the chief source of supply to the testicle, and the occurrence of the pain is in keeping with a common segmental nerve-supply.

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THE COMPARATIVE PHAGOCYTIC PROPERTIES OF THE LEUCOCYTES OF THE DIFFERENT BLOOD GROUPS.

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WHILE investigating some points regarding the opsonic index it was borne in on me that, ceteris paribus, there was some inequality in the amount of phagocytosis displayed by leucocytes derived from people belonging to different blood groups. Accordingly I carried out a number of similar experiments to test this point, the details of the first one being as follows (the Moss nomenclature is employed) :—

I took serum from each of three normal workers belonging to group iv., iii., and ii. respectively. At the same time I prepared leucocytes from these same three by bleeding from each of them direct into citrate and washing the corpuscles obtained in normal saline ; I then made opsonic mixtures with emulsion of tubercle bacilli of all the serums, using each of the three washed corpuscles in turn, and after a suitable incubation made opsonic films which I counted, the resulting intakes of bacilli per 100 leucocytes being shown in Table I. :—

TABLE I.

Serum.	EJS corps group iv.	JS corps group iii.	FM corps group ii.
EJS .. .. iv.	 239	 302	 346
JS .. .. iii.	 245	 210	 248
FM .. .. ii.	 270	 294	 334

Taking the first column (EJS corpuscles group iv.) 100 leucocytes ingested 239 bacilli when put up with EJS serum, 245 with JS serum, and 270 with FM serum ; in other words, 300 leucocytes belonging to group iv. ingested a total of 754 organisms when put up as to 100 with iv. serum, 100 with iii. serum, and 100 with ii. serum. Similarly 300 leucocytes belonging to group iii. took up 806 organisms, and 300 belonging to group ii. 928.

Now, in each of these three cases the serums are the same, and the emulsion of bacilli is the same, the only factor that is different being the corpuscles. Hence, this experiment shows that with similar conditions equal numbers of group iv. leucocytes take in 754 organisms, group iii. 806, and group ii. as many as 928, a result which may be expressed for convenience as 100, 107, and 123, taking the group iv. figure as the standard.

TABLE II.

Organisms used—	iv. corps.	iii. corps.	ii. corps.	i. corps.
Tubercle.	AEW100	JS119	FM174	
,,	AFH100	JS112	FM136	
			ABP124	
Staph.	AFH100	JS138	FM157	
			LC132	
,,	AFH101 } Av.	JS83	LR162	
	EJS99 } 100		JF125	
Coliform.	AFH100	JS85	FM125	
	EJS103 } Av.	JS111	FM108	
,,	AFH97 } 100			
Typhoid.	AFH100	JS112	FM121	
			LR114	
Tubercle.	EJS100	JS101	FM110	Rb.89
Staph.	EJS100	JS91	FM125	Rb.90
Coliform.	EJS100	JS95	FM96	Rb.89
Tubercle.	AFH100		FM117	
Staph.	JM100	JS103	FM116	
			JF108	
,,	GO100	MY114	FM144	
		ZK104		
Tubercle.	AFH100		FM127	
Staph.	AFH100		GD118	
,,	AFH100		FM130	

Staph. = staphylococci.

I repeated this experiment several times with emulsions of tubercle bacilli, staphylococci, and coliform organisms, using the serums of various apparently normal workers, with the exception of Rb. of group i., who was a patient with some chronic tuberculous hip trouble. The results appear in Table II.

I also varied the experiment by using iv. and ii. corpuscles, and putting them both up to several different serums with the results shown in Table III :—

TABLE III.

No. cases.	Organisms used.	iv. corps.	ii. corps.
7	Tubercle.	AFH100	FM125
6	Staph.	AFH100	GD122
4	,,	AFH100	FM131

Looking down these figures it is seen that, other conditions being equal, with one exception group ii. leucocytes always ingest more organisms than an equal number of group iv. leucocytes, the average excess over the whole series being 28 per cent. In other words, while group iv. leucocytes take in 100 organisms the same number belonging to group ii. take in 128, indicating that the powers of group ii. leucocytes in this respect are decidedly in excess of those of group iv. But the question inevitably arises as to whether the various preparations are really made under the same conditions, and there seem to be three possible variations in these "same conditions" which merit investigation : (1) The leucocytic content of the bloods derived from the various groups may differ substantially between themselves, giving rise to different percentages of leucocytes in the various preparations of washed cells ; (2) the different preparations of washed cells, though intended to be made under precisely similar conditions, may, through unavoidable errors of technique bear different relations to their respective parent bloods ; (3) in preparations made with group iv. serum and group ii. corpuscles the clumping of the red cells may leave the accompanying white cells under different conditions, qua phagocytosis, to those in preparations in which there is no clumping.

To test the first point I counted the number of leucocytes in the bloods of 11 normal persons belonging to group iv. and 11 belonging to group ii. ; the average thus obtained was 8565 per c.mm. for group iv. blood, and 8195 for group ii., or in the proportion of 100 : 98 ; this difference is quite negligible, and no influence seems to be due to varying leucocytic contents in the two groups.

As regards the second point, granting that variations in the number of leucocytes makes a difference, as is certainly the case, is it likely that in some 25 cases the difference should always show itself in the one direction ? The common law of chances would lead one to expect that the differences should show themselves half on one side and half on the other, and not, as I have found, very decisively on one side of the line. Furthermore, is such variation as marked as at first sight it appears ? If an opsonic mixture is put up with a preparation of washed corpuscles, and again with the same corpuscles diluted with an equal volume of saline, the half number of leucocytes in the second preparation would not individually phagocytose twice as many as their fellows in the first ; the ratio would not be as 20 : 10, but as log 20 : log 10, as I have found in several experiments which I did to test this point. Such a variation as 100 per cent. is unthinkable in the preparation of two specimens of washed corpuscles when made carefully in the same way, and a difference of 25 per cent., which is considerable, would on this showing only produce a difference of some 10 per cent., and nothing approaching the 28 per cent. which I have found above.

To test the third possibility, that the presence or absence of clumping of the red cells may make a difference, I made experiments by putting up several serums with both group iv. and group ii. corpuscles altogether I used eight group iv. serums and eight group ii. serums. In all cases where group iv. corpuscles are used there will be no clumping, but when group ii. corpuscles are used there will be with the group iv. serums, but not with the group ii. ones. Thus, there will be two comparable series in which the

relative intakes of group iv. and group ii. corpuscles can be measured: (1) one series of group iv. serums where there will be clumpings, and (2) another of group ii. serums where there will be none. The results obtained showed that the relative intakes of group iv. and group ii. corpuscles in the first series was 100 : 126, and in the second 100 : 122. These figures do not suggest that any appreciable difference is caused by clumping of the red cells.

Conclusion. Other things being equal, group ii. corpuscles phagocytose some 25 per cent. more than group iv. corpuscles.

THE PASSAGE OF IODIDES INTO THE CEREBRO-SPINAL FLUID.

BY HENRY COHEN, M.B., CH.B. LIVERP.,
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IN his work "Le liquide céphalo-rachidien" Milian[1] summarises the work done on the "permeability of the meninges" to iodides up to the year 1905. With few exceptions it was found that in the meningitides—tuberculous, syphilitic, and meningococcal—oral administration of iodides was followed by their appearance in the cerebro-spinal fluid. In normal subjects, or those suffering from nervous diseases other than those associated with meningitis, no passage of iodides from blood to cerebro-spinal fluid could be demonstrated.

In 1916 Catton[2] published observations on the cerebro-spinal fluid of six patients having iodide medication by the mouth. Five of these, with no evidence of meningitis, taking 15–30 gr. of potassium iodide for three weeks to three months, were tapped on two occasions. At the first tapping as much fluid as possible was withdrawn. Since it had been reported by Barbat[3] that the fluid obtained from a second tapping of a patient receiving arsenical treatment was richer in arsenic than the first obtained fluid, Catton re-tapped his patients 48 hours to 10 days after the first puncture. In none of these fluids could iodine be demonstrated by the starch test after fusion of the fluid with potassium nitrate and sodium carbonate. In one patient with tabes, on oral iodide medication, an additional dose of 250 gr. failed to produce iodide in the fluids obtained 18 minutes and 24 hours later. In this case both chemical and electrolytic tests were applied; in the latter the control used was 0·01 per cent. of iodine—i.e., 10 mg. per 100 c.cm. These observations confirmed those of the older workers, but in 1921, Osborne,[4] using Kendall's method for the quantitative estimation of iodine, found that normal cerebro-spinal fluid contained an average of 0·018 mg. of iodine per 100 c.cm. of fluid. Oral administration of potassium iodide (50 to 100 gr. three hours before spinal puncture), though causing no rise (or a rise too small to be accurately titrated) in four cases, in two others caused a rise in the iodine content to 0·335 and 0·357 mg. per 100 c.cm. respectively. Two determinations on patients receiving potassium iodide by rectal administration only showed 1·808 mg. and 0·381 mg. of iodine in 100 c.cm. of fluid. Intravenous administration of sodium iodide led to a definite increase in the iodine content—from 0·400 to 2·784 mg. per 100 c.cm. It is interesting to note that in Osborne's series of cases by far the highest iodine value—42·308 mg. per 100 c.cm.—was obtained in a case of neurosyphilis, with marked meningeal involvement.

Investigation.

In view of these conflicting results, as compared with those of the previous workers, it was thought advisable to re-examine the question. Kendall's method is a long and tedious process. Moreover, as "one drop" of the titrating agent—N/200 sodium thiosulphate—is equivalent to 0·005 mg. of iodine, and the normal content of 100 c.cm. of cerebro-spinal fluid is only 0·018 mg.—i.e., 100 c.cm. of fluid is titrated with just over three "drops" of N/200 sodium thiosulphate—it was felt that, as in most cases only 5–10 c.cm. of fluid is available, which in a normal case would need only 3/20–3/10 "drops" of the titrating agent, Kendall's method was unsuitable for a general investigation.

Working on tests for iodides I have found that in the starch test the amount of nitric acid (+ nitrous acid) added is an important factor. No colour is obtained if an excess or too little of the acid be used, so that in doing the test it is necessary to add the acid drop by drop to the fluid, containing starch as indicator, until the optimum colour is obtained. Taking this precaution, one is able to detect 1 part of iodide in 200,000—i.e., 0·5 mg. per 100 c.cm. As Osborne had obtained over 2 mg. of iodine per 100 c.cm. of fluid after intravenous administration of sodium iodide, the application of the starch test as described above is sufficiently delicate to test the accuracy of his observations.

The following table shows the results of an investigation of ten cases, normal and abnormal.

Case.	—	C.cm. of 10 per cent. potassium iodide injected intravenously.	Time, in minutes, between injection and puncture.	Modified starch test.
1	Normal	50	12	Negative.
2	,,	50	35	,,
3	,,	50	45	,,
4	Tabes.	50	60	,,
5	,,	50	60	,,
6	Disseminated sclerosis.	50	30	,,
7	T.B. meningitis.	50	20	Positive.
8	,,	50	30	,,
9	Syphilitic meningitis (acute).	50	20	,,
10	Meningismus.	50	20	Negative.

In each case 50 c.cm. of 10 per cent. potassium iodide was injected intravenously; at intervals varying from 12 to 60 minutes, cerebro-spinal fluid was withdrawn and examined with the starch test: (1) directly by addition of HNO_3 (+ HNO_2), and (2) after fusion of the fluid with sodium carbonate and sodium nitrate.

Two practical points of considerable importance may here be noted. First, a trace of blood mixed with the fluid will produce a positive reaction due to the iodide in the blood; and secondly, care must be taken to see that the patient is free from organic heart disease before trying these tests, as in one case known to the writer serious consequences followed the intravenous injection of the potassium iodide.

Discussion.

The results given in the table are in agreement with those of the workers earlier than Osborne. The meningitides gave positive results; other diseases—tabes, disseminated sclerosis, meningismus—and "normals" gave negative results. Thus the rise observed by Osborne in normal cases is probably excessive. Our results indicate that if it occurs it is less than 0·5 mg. per 100 c.cm. This is of interest, since the amount contained in the blood after intravenous injection of 50 c.cm. of 10 per cent. potassium iodide is more than 100 mg. per 100 c.cm. of blood. We have thus a concentration of iodides many hundred times greater in blood than in the cerebro-spinal fluid. In view of the great diffusibility of iodides through tissue cells—witness their rapid excretion by the kidney—no physico-chemical theory of the formation of cerebro-spinal fluid will be satisfactory until it explains the phenomenon of the resistance of the cells of the choroid plexus to this salt. As a purely descriptive term "selective permeability" is doubtless unobjectionable, but when afforded as an explanation of the facts must be regarded as mere verbiage.

References.—1. Milian: Le liquide céphalo-rachidien, Paris, 1905. 2. Catton: Jour. Amer. Med. Assoc., 1916, lxvii., 1369. 3. Barbat: Californian State Journal, 1915, xiii., 435. 4. Osborne: Jour. Amer. Med. Assoc., 1921, lxxvi., 1384.

Clinical and Laboratory Notes.

A CASE OF PERI-ONYCHIA, DUE TO A BLASTOMYCES.

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Assisted by F. R. CHOPPING,
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THE following case is of interest and merits record :—

A married woman consulted me with regard to an affection of the "quicks of the nails of the right hand," which she had been told by her doctor was tuberculosis. Eighteen months before consulting me she had had a similar lesion of the left hand, the nail of the ring finger being involved, but after lasting 12 months the trouble had cleared up entirely. This freedom only lasted about a month; the present trouble then started in the right hand. The lesions on the ring and little finger of the right hand are well seen in the photograph (Fig. 1), the swelling of the peri-onychia being not so clear as the ridging and superficial destruction of the nail. She stated that they were always worse in hot weather, when her hands perspired freely, or when she had had her hands in hot water.

Bacteriology.—At the first examination very little pus was obtained, and films and cultures only revealed the presence of a staphylococcus. As heat and moisture were known to produce a free flow of pus, she was asked to foment the

FIG. 1.

Lesions on ring and little fingers, showing swelling of peri-onychia and (more clearly) ridging and superficial destruction of the nail.

fingers freely, using a saline solution. This produced a very notable reaction and a free discharge of pus. Films showed the presence of staphylococci in small numbers, and of large numbers of yeast-like bodies and mycelial threads. These were Gram-positive. A very large number of inoculations were made on a variety of media, which included several tubes of Sabouraud's maltose agar. A *Staphylococcus albus* alone grew on the ordinary media, but on Sabouraud's medium a yeast-like growth appeared after 48 hours, in addition to staphylococcus. Sub-cultures of the yeast-like growth were readily obtained on Sabouraud's agar, but not on any other medium. At first these colonies were large, white, raised, circular, and waxy, but after some three weeks they had a most characteristic appearance due to both outgrowth and (chiefly) downgrowth of radiating fern-like processes (Fig. 2). These downgrowths penetrated quite deeply into the medium, giving the culture a very pretty appearance. The surface growth of such colonies was composed chiefly of spores, while the deeper growth was made up of both branching mycelium and spores. After several sub-cultures the organism was induced to grow on gelatin, and in the sugars, but it was quite six months before it could be grown on agar-agar. On the gelatin and the agar it grew very similarly to Sabouraud's agar, save that the frond-like downgrowths were comparatively feeble. In the sugars the mycelial elements predominated. Gelatin was not liquefied; acid, but no gas, was formed in glucose, lactose, sucrose, and

FIG. 2.

Sub-culture of yeast-like growth on Sabouraud's agar, showing characteristic appearance of outgrowth and downgrowth of radiating fern-like processes.

mannite, but not in dulcite. Growth occurred best at 28° C. During the course of the treatment of the case the same organism was obtained three times from the pus in culture. We observed the cultures over a very long period, and were struck by the tendency, as time went on, for sub-cultures to become largely mycelial and even almost bacillary in type. Finally the organism declined to grow in sub-culture at all. This organism would appear to belong to the genus Monilia, variety of Link, but classification is notoriously difficult.

The lesion resisted all treatment until iodine was tried locally, and the preparation suiting it best was collosol iodine oil. The patient has been under observation for over two years, and up to date there is no report of a recurrence.

A CASE OF TRAUMATIC LACERATION OF A HYDRONEPHROSIS.

BY W. GIFFORD NASH, F.R.C.S. ENG.,
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Mr. H. W. L. Molesworth, of Folkestone, recently described[1] a case of traumatic rupture of a hydronephrosis and stated that he knew of no English case or specimen which illustrated this accident. The case I am about to relate differs from those quoted by Mr. Molesworth in that the laceration did not involve the whole thickness of the hydronephrotic sac.

A married woman, aged 48, on June 22nd, 1904, while running at a school treat, fell forwards, her abdomen striking the ground.

Condition on Examination.—The late Dr. Horace Savory saw her the same evening on account of abdominal pain and vomiting. The pulse was 80, and there was hæmaturia but not much collapse. Nothing could be felt in the abdomen.

[1] THE LANCET, 1923, ii., 224.

On the 23rd the morning urine contained blood, but at midday it was clear. A lump could be felt in the right half of the abdomen. In the afternoon I saw her with Dr. Savory. A large movable lump occupied the right loin, extending inwards as far as the umbilicus. The vomiting had ceased and the urine was almost clear. Temperature 99·4° F. We obtained a history of an attack of pain in the right loin 26 years previously, a second severe attack three or four years later, and in the last 13 years occasional mild attacks of pain and a swelling had been noticed. This swelling was evident a week or ten days before the accident.

Course of Case.—Our diagnosis was that a hydronephrotic kidney had been bruised by the fall. On the 24th and 25th the swelling remained much the same, and the urine contained blood. On the 26th vomiting recurred and the pain increased. The urine was very dark and blood-stained, and the swelling much larger and more tender. Operation was decided on that day.

Operation.—An incision was made in the right loin, and a large hydronephrotic kidney exposed. It was incised and bloody urine escaped. The kidney was removed, and the wound closed. The hydronephrotic kidney measured 8 × 5 × 4 inches. The pelvis was very dilated, and the whole kidney sacculated. In the floor of the pelvis was a laceration about an inch and a half long, from which, no doubt, the bleeding took place.

The patient left the nursing home in three weeks and has remained well.

FIVE CASES OF PSEUDO-HYPERTROPHIC MUSCULAR ATROPHY.

BY R. LEONARD LEY, M.B., B.C. CAMB.,
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THE following five cases of this disease, all of facio-scapulo-humeral type, have been seen by me at various times during the past three years. The cases are all boys of ages ranging from 14 to 5 years, belonging to two families of which the mothers are sisters. The grandparents were healthy and I can find no record of other cases in the family.

The grandparents had four daughters; one is married without children, another is married with several healthy male children of ages ranging from adult life to babyhood.

The third sister has two children, both boys; of these, one, aged 14, has had the disease for six years and is now helpless, but still has large buttocks and calves, and when I first saw him had the characteristic "swagger" gait, he climbed up himself to reach the standing position, and had the characteristic slackness about the shoulder-girdle with an expressionless face. His brother is 11 years old, has had symptoms for two years, and is now in the most marked stage with all the classical symptoms.

The fourth sister has four boys. One, aged 14 years, has had the disease for two years. Is still capable of walking. The second boy, aged 10 years, has been affected for 12 months and has typical manifestations. The third boy, aged 5 years, has large calves and buttocks. He climbs up himself and is, I think, affected, but the accuracy of the diagnosis is open to objection on the ground that he may be imitating his brothers. The youngest child is as yet unaffected.

The two sisters whose children are affected are very alike and both dark. The sister whose family is unaffected is fair and quite unlike the other two.

THE INTERNAL SECRETION OF THE TESTIS.—In Mr. Kenneth Walker's article published in THE LANCET of Jan. 5th, Figs. 4 and 5 appeared transposed, the section of the testis of a child of 3 being described as that of a fœtus, and vice versa. The transposition rendered meaningless the parallel drawn by Mr. Walker between the testis of a fœtus and that of a mole in the resting state.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

ON Jan. 8th the Sections of Medicine, Neurology, Obstetrics and Gynæcology, Psychiatry, and Surgery held a joint meeting at 1, Wimpole-street, W., to discuss

POST-OPERATIVE AND PUERPERAL MENTAL DISORDERS.

Dr. T. B. HYSLOP opened the discussion from the chair. With reference to these disorders, he said, there was probably not much difference of opinion between members of various sections as to the influence of heredity. With regard to the mental factors of causation, they were probably also all agreed that certain degrees of anxiety—such as that associated with the bearing of an illegitimate child—were sufficient in themselves to produce a certain mental colouring which led to mental disorders. The effects of severe labour, of suppression of the lochia, of previous attacks of insanity, were known; it was said among alienists that when a woman developed the habit of mental disorder when bearing a child, it was well to let her wait two years before again becoming pregnant, in order that the memory of the previous pregnancy might be obliterated. The question arose as to whether mental disorders of the puerperium occurred oftener in primiparæ than in other women. There was an old Scots saying: "Look out for the brown-eyed puerperal"; and he had found that a large proportion of sufferers from puerperal insanity were actually brown-eyed. From the clinical point of view, alienists now noted a comparative absence of the acute febrile puerperal condition; was this due to a subtle change in environment, or to a change in methods of dealing with these cases? He had observed that the puerperal attack of insanity frequently began in the night hours; the patient woke up insane, became violent, and might attack those around her, or might commit infanticide. In the latter event the case then became medico-legal. The puerperal homicidal case was most painful; the patient's symptoms might disappear before her trial, but she would be found "guilty but insane" and sent to Broadmoor during His Majesty's pleasure. He would like an expression of opinion concerning the duration of these types of mental disorder; alienists had come to recognise a three months' type, a six months' type, and so on—none of them necessarily incurable. He found himself at variance with the legal view concerning these cases, but he felt that until there was more enlightenment in the law courts it was more productive of good for medical men to keep to discussion of clinical and pathological phenomena.

From the Surgical Side.

Sir CHARTERS SYMONDS said he should deal with the subject from the surgical side only. In 40 years' experience of surgical operations he had only met with four cases of mental disturbance directly resulting from operation. The first of these was a man over 60, who had had prolonged intestinal obstruction. At operation there was an enormous evacuation of material; this case might have been due to toxæmia. The patient had to be moved to the strong room: his mental disturbance was of a type allied to delirium tremens, but he could sometimes be engaged in conversation. With good nursing he was perfectly well in six weeks, and remained well for 18 months afterwards. In this case there was no general septic state at all. In the second case the antecedent condition of the patient was interesting; she was a girl of 20, who had appendicitis with much suppuration. Her disorder took the shape chiefly of delusions; it supervened the day after the operation, the patient becoming noisy and difficult to feed. She was clearly of an emotional type, unstable and given to writing

stories; her mother and sister were sensible women, but her father's mentality was unknown, he being dead. The third case was in a highly intellectual man of over 70, who after operation went on well for eight days; he (Sir Charters Symonds) returned from a few days' absence to find the patient insane, the main feature of the case being an inability to take more than small quantities of fluid. The patient finally became very thin, with extremely dry skin. He was convinced that the condition was one of post-operative mental disturbance, although the medical man in charge of the case attributed it to senility. Chance, however, put the case into his own hands, and he injected a pint of saline into each axilla. The patient, who had apparently been about to die, was better next day, and finally recovered. There was no rise of temperature throughout. Why should this patient have had the attack? The only antecedent condition was that of very high intellectual development. The fourth case was that of a very excitable Jew, who had had a great deal of trouble with his prostate, and after operation had a severe mental attack, which made it impossible for him to be kept in the nursing home. These, then, were his only four cases of what he believed to be a very uncommon condition. With regard to the allied condition of delirium tremens, he had two or three cases a year, in his ward at Guy's Hospital, in patients with simple fracture of tibia or fibula—men who no doubt drank too much, but were never ill until after sustaining the fracture. He thought that in these cases of mental disorder following operation or acute illness there was no occasion to move the patients, at least for a period of six weeks, in which they generally improved. From his experience he had gathered that the danger in this connexion was not very great.

From the Neurological Side.

Dr. JAMES COLLIER said that in his experience as a neurologist and general physician he had not found these cases common. He had not given the condition much deep thought, but from the point of view of the nervous system he had seen every portion of the brain removed in operations for tumour, and only rarely had mental disturbance followed operation. Lesions of the brain were usually associated with reduction, not with aberration, except in syphilis. Post-concussive insanity seemed never to occur after operation. He had had four cases of mental disturbance in patients with tumours; in three of these, where the tumour was of considerable size and the shock of operation violent, mania persisted until death, with slight pyrexia throughout, and no obvious cause of death was found post mortem. In the fourth case the patient recovered; here no attempt was made to remove the tumour, which was deep-seated. The patient developed delusions and became troublesome, being sent to an asylum. In six months he recovered, and remained normal for two years; this recovery took place in spite of the cerebral injury remaining. Operations on the brain gave rise to insanity no oftener than operations on other parts. He had seen melancholia following several prostate operations, and after renal operations, but none following operations on the thyroid, pituitary, and suprarenals.

From the Obstetrical Side.

Mr. ALECK BOURNE said that those morbid conditions which lay on the borders of two specialities of medicine were in danger of neglect, as each group of workers might repudiate the responsibility of special study. The ætiology and prognosis of puerperal insanity was an instance of this incomplete study and neglect of contact between two groups of special workers. He had collected a few cases of his own, and notes of others from several hospitals; the chief difficulty in producing any account of the subject was the inadequacy of the clinical notes. The records frequently gave detailed descriptions of the labours, but only the scantiest notes of the insanity or factors of ætiological importance. Another difficulty was that these patients were quickly transferred from the lying-in hospital to an infirmary at the least sign of mental disturbance, and from the infirmary they were moved to an asylum. By following patients up to the asylum it had been possible to get a fairly complete account of their subsequent history, and in a few cases he had traced patients to their homes after so long a period as 12 years. Sufficient ætiological details had been obtained in 61 cases. In few instances full accounts of antecedent conditions were obtained, but it was clear that physical puerperal diseases had played a large part as exciting causes. In nine of the 61 patients (five single, four married) no cause of any kind of insanity was apparent. The possible influence of pregnancy in the single state was suggested by the fact that unmarried patients constituted 36 per cent. of the whole number; it might be argued that mentally feeble single women were more likely to become pregnant than those in sound mental health, but that contention was not borne out by the figures; for example, of 12 patients with previous mental trouble or bad family history, only one was single. Insanity associated with puerperal sepsis lasted for many months after the fever had subsided. After uterine infection, eclampsia was the next most important organic disease. The character of labour appeared to have no ætiological significance. Primigravidæ formed 59 per cent. of the total number of cases. In 18 cases, or 27 per cent. of the total number, there was unstable mental equilibrium or bad family history; had the notes been more detailed, this number would probably have been higher. With regard to time and manner of onset, of 64 cases noted, 4 developed insanity during the latter part of pregnancy, 6 became "mental" during labour (some being eclamptic), 39 showed the first symptoms during the first week, and only 18 were first affected during the second week. Three patients became insane from three to six weeks after delivery. The manner of onset was very similar in the great majority of cases. There were usually some nights of sleeplessness, after which the patient talked with some incoherence, and quickly developed more definite symptoms, such as aversion for food and for the baby, and delusions. Later restlessness and agitation would increase; most of the patients became maniacal, a lesser number became depressed and stuporose or morbidly religious. Coming to results, sufficient details had been obtained to show a mortality of 13 patients out of 58 (i.e., 22 per cent.). Of the 13, 6 died of the effects of infection, 2 committed suicide, 2 died of cardiac failure (one after 18 months in an asylum), and in the remainder the cause of death was not ascertained. He had traced 36 patients who had survived. Of these, 28 (78 per cent.) had been discharged from asylums or infirmaries after a varying time as "recovered," while 4 were "relieved." Four patients were still in asylums in a chronic condition of insanity. Of 13 cases of uterine infection traced, 6 died and 7 recovered. Six cases of eclampsia traced had all recovered—a result which he believed was in accord with the general experience of eclamptic insanity. Of 9 patients traced who had had previous attacks of insanity or bad family history, 3 recovered, 3 were relieved, and 3 were still confined in an asylum. The average time before recovery varied from two weeks to three years, the actual average being six and a half months. Apart from eclampsia, there was little correlation between cause and length of time in the asylum. Patients who remained insane for the longest periods were chiefly those with either no obvious ætiological factors, or very slight conditions such as mild pyrexia during the puerperium; those with a hereditary factor who recovered did so in less than six months. The details of the variety of insanity were not sufficiently precise to yield any basis for formulation of prognosis. Summing up, it was possible to say that the prognosis of puerperal insanity depended first upon the severity of the organic disease. Half of the fatal cases died of some variety of infection. The majority (77 per cent.) of the survivors recovered their mental

health, though many of them might again become insane should they be subjected to another pregnancy and labour. From letters received from husbands of patients, and from asylum reports, it seemed clear that if a patient who had had previous attacks or a collateral history of insanity became pregnant subsequently she was prone again to become insane; but should insanity be only a symptom of a severe organic disease such as puerperal sepsis or eclampsia, the probability was that it would not appear again in a future puerperium.

Discussion.

Sir MAURICE CRAIG thought that the fewness of the cases of post-operative insanity seen by the surgeon was due to the fact that the surgeon did not always get to know of cases which broke down weeks or months after the operation. Mental disorders might continue for many years afterwards; he had that day seen two cases resulting from minor operations several years ago. Patients broke down from various causes; the factor of heredity might be over-emphasised, but it certainly existed. Hyper-sensitivity was also important. As to the type of patient who broke down, there was an emotional type, but it was not well to assume that a person was stolid if he presented a stolid appearance. He attached great importance to the question of sleep. Certain sedatives would in certain cases stave off an attack of insanity. Sleeplessness after operation was important; it was sometimes looked upon as to be expected, and some patients could put up with it, but others could not, and in the latter the nervous system might protect itself by producing confusion. Altered blood pressure was also of importance. Mental deterioration was sometimes so rapid, in the absence of sepsis, that there must be some cause for it. Much mental instability might be avoided if the patient's nervous make-up were inquired into before operation was attempted.

Mr. H. J. F. SIMSON congratulated Mr. Bourne on his contribution to the discussion, and said that he had made it plain that from the obstetric point of view there were two types which gave rise to insanity: (1) the puerperal form due to sepsis, and (2) those with a hereditary tendency. If insane once, should a woman be allowed to become pregnant again? He was often asked to see a patient in the fourth month who had been told on the occasion of a previous pregnancy that she must not again become pregnant. If a patient was mentally unstable this was a serious thing to say, as it tended to produce a condition giving rise to puerperal insanity. If asked by such a patient to terminate the pregnancy, he thought the obstetrician should open the abdomen, and tie the tubes at the same time, informing the patient before doing so. He agreed with Sir Maurice Craig as to the importance of sleep. After the birth of the child it was well to keep the patient under the influence of some narcotic for 48 hours, to enable her to get over the shock.

Dr. R. CARSWELL believed in the existence of a great group of cases distinct from idiopathic insanities (manic-depressive states, dementia præcox, &c.); some of these cases had just been described. Many cases of transient insanity were seen during the puerperium, notably during the lactational period; they were often associated with clearly-defined lactational exhaustion, a condition commonest among the working classes. These confused, stuporose, transitional conditions were episodic, not idiopathic; if given time the patient almost certainly recovered. The number of cases of puerperal insanity had decreased; in an extensive experience he had rarely seen a case which required to be moved from a maternity hospital. This, he believed, was because the risks of infection were lessened, whilst a general advance in obstetric practice had taken place.

Dr. C. LOCKYER emphasised the importance of puerperal infectious lesions, of which the prognosis was very grave. He would suggest that the alienist too often got cases of puerperal insanity to look after; would it not be better if a skilled obstetric physician were attached to all mental hospitals?

Mr. A. CARLESS thought that there would be much fewer cases of post-operative mental disturbance if surgeons were not in such a hurry to get patients out of the nursing home or hospital. He always kept his patients in hospital for three weeks after operation. Instead of attaching an obstetrician to a mental hospital, he would suggest the attaching of a mental specialist to each obstetric hospital.

Reply.

Dr. HYSLOP, closing the discussion, said that it had to be recognised that the individual might be, as it were, a saturated solution of nervous instability; a small factor might occasion a train of ideation producing a definite psychosis. For example, to have a tooth out might cause serious trouble; and the bearing of children must be looked at from this point of view. Again, the beneficial effects of operations of general character upon insane patients were sometimes extraordinary. It must be remembered that in country hospitals which were not near a teaching hospital it would be very difficult to obtain the services of an expert gynæcologist.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

DIAGNOSIS AND TREATMENT OF NEURO-SYPHILIS.

A MEETING of this Society was held at 11, Chandos-street, W., on Jan. 11th, under the chairmanship of Colonel L. W. HARRISON.

Dr. GORDON HOLMES opened a discussion on this subject. He pointed out that the term "neuro-syphilis" included many conditions differing in their clinical forms, their pathological basis, and the manner in which they reacted to treatment. It included the para-syphilitic conditions, tabes dorsalis and general paralysis of the insane, on the one hand, and interstitial neuro-syphilis on the other. It was now known that even in the earliest stages of syphilis many changes could be found in the cerebro-spinal fluid. Here an increase of cells might be found in something like 40 per cent. of all cases, although, of course, the proportion of people infected by syphilis who later in life developed nervous symptoms was not nearly as high. There was no evidence that those who later in life developed any form of neuro-syphilis were those only who in the earlier stages of infection showed changes in the cerebro-spinal fluid. Consequently it must be concluded that these changes in the cerebro-spinal fluid were, from the point of view of prognosis and treatment, of relatively little importance. It appeared that changes in the cerebro-spinal fluid were valuable as a sign chiefly when found in the second or third year. All would admit that the examination of the fluid, especially an isolated examination, or examinations repeated only over a short period, must fail to give any clear indication of whether the condition was a definitely stationary disease, a disease which for the moment was stationary but might progress, or a disease which was actually progressing. Altogether, the testing of the cerebro-spinal fluid in itself could not be a reliable guide to prognosis or to treatment. The speaker said that most of the cases of tabes in which the cell count fell and the globulin content diminished were those submitted to repeated lumbar puncture. The cell content of the cerebro-spinal fluid varied considerably at different levels. The proportion of cells decreased as one descended the spinal cord, so that there was always a larger proportion in the fluid obtained by lumbar puncture than in the fluid obtained by any other means. Many of these pathological cells persisted unchanged for a long time within the fluid. If a lumbar puncture was done several times, the proportion of these cells in the lower part of the cord was drawn off, and consequently the proportion found in the later counts was reduced.

As to the influence of treatment on the cerebro-spinal fluid in general paralysis of the insane, he could not find trustworthy evidence of marked improvement in any considerable number of cases in general paralysis, or, on the other hand, that any form of therapeutics had succeeded in altering seriously the pathological changes in the cerebro-spinal fluid, unless, of course, there was repeated lumbar puncture. It was frequently forgotten that such pathological changes in the fluid did not necessarily indicate that the lesion of the central nervous system was syphilitic. In his own practice Dr. Holmes admitted to more than one serious mistake in being guided by the changes in the cerebro-spinal fluid. Since the prominence recently given in the public press to the prevalence of venereal disease the public had begun to assume that all organic lesions of the nervous system were of syphilitic origin, which was unjustifiable. In conclusion, Dr. Holmes said that the study of the cerebro-spinal fluid was no sure guide to the efficiency of treatment or prognosis in neuro-syphilis, except in the interstitial variety. Moreover, except in interstitial syphilis the diminution of the pathological changes in the central nervous system was no indication of improvement or control of the disease. On the other hand, he would insist upon intensive treatment in certain cases of tabes and general paralysis in which efficient treatment had not been resorted to in earlier stages of the disease. The most important consideration was that the patient must be treated, not the spirochæte or the actual or presumed symptoms of its activity in the central nervous system. New tests which had been introduced, especially the examination of the cerebro-spinal fluid, had made more and more necessary a clinical investigation of every case that presented any symptom of neuro-syphilis. In his experience, and in the experience of many others on the neurological side of the question, mercury was par excellence the drug with which to treat these conditions.

The Drawbacks to Lumbar Puncture.

Dr. PHILIP PANTON referred to the drawbacks of lumbar puncture, and raised the question as to whether it was justifiable as a routine practice to do lumbar puncture in order to ascertain whether or not a patient was cured. There were two strong objections to lumbar puncture as a routine procedure; first, that it was a most unpleasant operation because the patient was apt to get lumbar puncture headache in its worst form, and secondly, because even if there was a complete negative cerebro-spinal fluid it could not be definitely said that he had been cured of syphilis. Still, there were occasions when it was justifiable to examine the fluid for this purpose, since it afforded about the best evidence obtainable of clinical or visceral cure—if that expression could be used. The patient might still, however, have syphilis progressing in his central nervous system. The examination of the cerebro-spinal fluid could only be described as a guide, and not as a conclusive determination.

Dr. D. NABARRO said that he had very rarely found lumbar puncture headaches in the case of adults, and he wondered whether the cause of such headaches, when they did arise, was the size of the needle used in doing the puncture. He always used a fine-bored needle, believing that there was then less risk of any leakage taking place afterwards. He had recently done about one hundred lumbar punctures on congenital syphilitics, and he had been surprised to find the positive W.R. and other changes pointing probably to syphilitic disease of the central nervous system in children in whom he had found no obvious symptoms whatever.

Discussion.

Dr. BRAXTON HICKS said that he had recently been working with colloidal benzolene, which he had found to be more efficient than the colloidal gold test.

Dr. H. SEMON suggested that some of the reactions which were observed by the pathologists might be deceptive. The mere fact of a positive W.R. or an excessive globulin content in the cerebro-spinal fluid was not in itself of bad augury.

Dr. DENNIS VINRACE asked whether it was possible to look forward to the injection of any curative agent into the spinal cord.

Mr. L. MYERS asked whether the cases with marked changes were being actively treated by anti-syphiltic drugs like mercury or N.A.B.

Dr. FOWLER WARD considered that to prevent lumbar puncture headache it was very necessary that the patient should be kept for 36 hours after the operation in a recumbent position.

Dr. J. G. GREENFIELD said that there was no test or combination of tests in the cerebro-spinal fluid which could distingusih general paralysis from interstitial brain syphilis. Clinicians often found it difficult in the early stages to distinguish between these conditions. On the other hand, the way that interstitial syphilis improved under treatment was a good diagnostic guide. There was no evidence that changes in the cerebro-spinal fluid might be present without any disease of the nervous system at all; the only evidence was that they might be present without demonstrable disease of the nervous system. He would like to corroborate what Dr. Gordon Holmes had said about the fallacy of emphasising too much a decrease in cells or in protein as being evidence of a clinical improvement, or of the success of the attack against the spirochæte. Even in cases of acute cerebellar abscess, where the inflammation of the brain was progressing and leading to the death of the patient, he had in quite a number of cases found a drop in the number of cells and a drop in the protein on the second puncture. He thought that that was purely a mechanical effect owing to the draining away of the cells in the lumbar cul-de-sac.

The PRESIDENT asked whether Dr. Gordon Holmes could give any opinion on the effect of bismuth on disease of the central nervous system. Bismuth was more penetrating, and possibly might be more useful than mercury.

Reply.

Dr. GORDON HOLMES had had no practical experience of bismuth. With regard to the efficiency of treatment in the early stages of syphilis on the occurrence of neurological symptoms, his own tendency was to share the pessimism which at least all neurologists felt, that even the most efficient and intensive treatment was not likely to reduce considerably the number of cases of tabes and general paralysis.

DENTAL BOARD OF THE UNITED KINGDOM.—A course of four lectures, illustrated by lantern slides, on the Jaws in Health and Disease, will be delivered at various centres during January, February, and March. The first lecture of the course is on the Development, Normal and Abnormal, of the Bones around the Mouth, by Prof. E. Fawcett, M.D., F.R.S. The second, on the Growth of the Jaws and Palate, will be delivered by Prof. James C. Brash, M.D., who will also give the third lecture on the Genesis and Growth of Deformed Jaws and Palates. The final lecture on the Teeth in Relationship to the Normal and Abnormal Growth of the Jaws will be given by Mr. G. Northcroft, L.D.S. R.C.S. This course will be delivered at 5.30 P.M. in the Anatomical Lecture Theatre of the University of Bristol on Jan. 25th and Feb. 1st, 8th, and 15th, Mr. Thomas Loveday and Mr. W. R. Ackland presiding; in the Medical Theatre of the University of Birmingham on Feb. 8th, 15th, 22nd, and 29th Mr. Grant Robertson, Mr. John Humphreys, Mr. F. W. Richards, and Mr. Cal Matthews presiding; at the Offices of the Dental Board, 44, Hallam-street, London, W., on Feb. 21st and 28th, March 6th and 13th, Mr. F. D. Ackland presiding; in the Surgery Theatre of the Medical School, University of Liverpool, on March 7th and 21st, and April 4th and 11th, Prof. Richard Caton, Dr. J. G. Adami, and Mr. E. H. Mountford presiding. The course is intended primarily for dentists and medical practitioners. Dental students are invited to attend. Admission is free without ticket. A lecture under the same auspices and conditions on Changes now Affecting the Jaws and Teeth of English People will be delivered by Sir Arthur Keith, F.R.S., in the Lecture Theatre of the Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C. 2, on April 29th, at 5.30 P.M., Sir J. Bland-Sutton presiding.

Rebiews and Notices of Books.

DIABETES MELLITUS.

Its Pathology and Treatment. By GEORGE GRAHAM, M.D. Cantab., F.R.C.P. Lond., First Assistant in the Medical Clinic, St. Bartholomew's Hospital; Physician, Royal Northern Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 200. 6s.

Dr. George Graham's book forms an introduction to an immense field of clinical and pathological research which may well lead, taken with the work of numerous contemporary observers, not merely to the more proper understanding and treatment of diabetes mellitus, but to the opening of many of the hitherto sealed doors that guard the secrets of animal metabolism. The use of insulin has, of course, altered entirely the outlook in diabetes mellitus; yet Dr. Graham would not have us look upon the disease as a condition caused merely by the diminished output of the internal secretion of the pancreas, nor does he regard the correct substitution-therapy by insulin in relation to diet as the final goal in treatment.

The problem of the cause of diabetes is a most complex one, and in Part I. of this book Dr. Graham emphasises the uncertainty of our present knowledge of the chemistry of the sugar in the blood, of the mechanism of its storage in the tissues, and of the regulation of its amount in the blood-stream. The work done by Cohnheim early in the century with regard to the rôle of the muscles in carbohydrate metabolism has again been brought into prominence by recent researches; the shutting out the liver from the portal circulation by means of an Eck's fistula does not apparently grossly disorganise carbohydrate metabolism. The action of the group of endocrine glands opposing the pancreas in determining the sugar content of the blood—the thyroid, adrenals, and pituitary—is shown to be very little understood. The second part of the book is concerned with the clinical aspect of diabetes, and contains some important chapters on the anomalies of the renal threshold: it has for a considerable time been recognised that certain individuals have a low threshold and so exhibit glycosuria without hyperglycæmia; they are consequently not true diabetics at all, and the converse condition is here alluded to—fortunately a rare one—in which a high renal threshold prevents glycosuria from being a symptom of hyperglycæmia.

The chief importance of the work, however, lies in the later chapters of Part II.: Dr. Graham's thesis is that treatment should be such as to enable the β cells of the islets of Langerhans to recover their lost function as far as possible. This thesis was, of course, the idea underlying the dietetic treatment of diabetes laid down both by Dr. F. M. Allen and Dr. Graham in pre-insulin days, and now also Dr. Graham would have the dosage of insulin, as well as the diet, subordinated to it. It is undoubtedly a cause for satisfaction that patients who have been having treatment according to these "ladder-diet" methods, should be treated by insulin, not as if it were a revolutionary method of treatment, but rather as if it were an extension of the modern dietetic treatment; moreover, the dangers of giving large doses of insulin in relation to a greatly increased diet have been pointed out by E. P. Joslin and others. But though there is fairly general agreement that we should not push up the dosage of insulin beyond a point which keeps a patient in a state of bodily health on a relatively low diet, the arguments underlying this agreement are various. Joslin, for instance, deprecates a fuller diet with a larger dosage of insulin, as enabling a patient to put on weight only at the expense of rendering the equilibrium of his metabolism more unstable, and he would have the "insulin-stilts" kept as short as is compatible with good health and a freedom from glycosuria. But Dr. Graham, insisting that the best use to which insulin can be put is to enable the islet cells of the pancreas to rest and recover their lost function, makes it his object to reduce the dose of insulin as soon as it has enabled the method of under-feeding to raise the sugar tolerance, and he ascribes the failure of other observers to raise the sugar-tolerance to the fact that too much carbohydrate has been given in the diet when the blood-sugar was still above normal. In support of his method he quotes cases of diabetes mellitus in which the carbohydrate-tolerance has been so raised by giving a low diet, together with a low dose of insulin, as to enable the dose of insulin to be still further reduced. Accurate reduction of the insulin dosage in relation to diet is guided by careful and frequent estimation of the fasting blood-sugar, and Dr. Graham holds out the hope that while the blood-sugar is kept normal, the metabolism of the patient will tend to approach to normal also. It is on such grounds that he conceives the possibility that insulin "plus" diet may in the end involve, not merely a substitution-therapy, similar to the treatment of myxœdema by thyroid extract, but, further, a progress towards a remedy for the disease itself, based upon widening comprehension of the underlying pathological problems.

Dr. Graham is the first to point out that his method of treatment is only on early trial, and that the evidences in its support are as yet scanty and require testing by other workers on diabetic patients over long periods of time. It has to be remembered, moreover, that the much-hoped-for raising of carbohydrate-tolerance by the modern dietetic methods of Allen and Graham before insulin was discovered was seldom realised, although much was effected in prolonging the life and bettering the general condition in many cases. Only time will show whether such a dietary plus insulin will be productive of this great result. In the meantime it must be realised that this method, if it is to be accurate, involves frequent estimations of the fasting blood-sugar, and opinions vary as to the practicability of such estimations in the midst of general practice. Diabetes in children, it will be observed, calls for special consideration: these cases are invariably severe in type and the treatment must provide for growth as well as for preservation of life. Dr. Graham suggests a relatively large protein intake in these cases—2 g. of protein per kilogramme of body-weight a day: it is to be hoped that some such rule may prove effective, pending the time when the fate of the products of protein digestion in the liver and elsewhere shall have become better understood.

Dr. Graham's book will stimulate all those who are likely to have to take charge of cases of diabetes, none the less because physiological and pathological problems involved are clearly and succinctly stated.

LATERAL CURVATURE OF THE SPINE AND ROUND SHOULDERS.

Fourth edition, revised. By ROBERT W. LOVETT, M.D., Sc.D., Professor of Orthopædic Surgery, Harvard University. London: H. K. Lewis and Co., Ltd. With 172 illustrations. Pp. xii.+218. 12s. 6d.

Prof. Lovett has revised his monograph on Lateral Curvature of the Spine, a subject on which he has long been recognised as an outstanding authority. To the average physician and surgeon the pathogenesis of scoliosis, and the treatment of the more advanced cases, have seemed to constitute a mystery understood by the few, and rendered still more obscure in the majority of the voluminous writings on the subject. In this new edition Prof. Lovett has achieved a greater simplicity in his presentation of difficult problems. This is much to be commended, as the book will now be more easily intelligible to the large body of well-trained gymnasts, who should be encouraged to use this work as one of their standard

text-books. The past decade has seen a revival of the operative treatment of scoliosis, the present aim being to produce ankylosis of the spine in the region of the deformity by one of the methods already utilised extensively in connexion with the treatment of Pott's disease. On this development the author writes in his accustomed judicial fashion, so that the inexperienced surgeon is not likely to be tempted to adopt an experimental method which at the present time is safe only in the hands of surgeons with special training. Prof. Lovett has done much in the past to emphasise the illogical nature of the treatment of advanced cases of scoliosis by gymnastics alone, and once again he shows that true improvement is to be looked for from the methods of forcible correction in plaster jackets.

L'ENCÉPHALITE LÉTHARGIQUE, SES PARTICULARITÉS EN BELGIQUE.

La clinique, la expérimentation. Par les Drs. L. VAN BOECKEL, A. BESSEMANS, C. NELIS. Bruxelles: C. Nossent and Cie. 1923. Pp. 608.

MEDICINE knows no frontiers but the intensive study of a disease new to general recognition like encephalitis lethargica in various countries of the world is of epidemiological as well as of clinical importance. Drs. L. van Boeckel, A. Bessemans, and C. Nelis have written a work of encyclopædic character on the disease, and most of the important inquiries carried out in all countries since von Economo's first report in 1917 are effectively crystallised. In particular the pioneer work conducted by the British Ministry of Health and the Medical Research Council receives recognition. Apart from the book's unquestionable claim to rank as an authority upon this disease, it is of interest to trace in its pages the manifestations of epidemic encephalitis in Belgium itself. Sporadic cases appear to have occurred from time to time in Belgium prior to the year 1919, and as in other countries form the subjects of retrospective diagnosis. During the war, with one doubtful exception, no examples of the disease were seen in the Belgian Army, and it was not until March, 1919, that it was identified at Ruddervoorde, in Flanders. Here a classical epidemic outbreak occurred, seven cases being declared in a household of ten persons in the space of a month and a half. In three other families within a month four, three, and two cases respectively appeared. The Minister of the Interior, following the English example, appointed a special medical commission to investigate the Ruddervoorde outbreak, over which Prof. van Ermengem presided, and the identity of the disease with encephalitis lethargica was established. Towards the end of 1919 many other cases of encephalitis were recognised in Flanders, and in January and February, 1920, the disease appeared equally in Eastern Flanders (Syngem, Andenarde, Antryve, Valkegem) and in the other provinces, and later it spread from the west to the east in Belgium. The authors estimate the number of persons attacked in Belgium from the beginning of 1919 to the end of 1921 at 700. The Belgian evidence, which is rich in multiple cases, agrees with the general view that the incubation period of the disease is short of less than a month's duration.

The case mortality based on the observations of 200 cases is found in Belgium to be 31 per cent. This is higher than the English figure for 1918 (22·0 per cent.) and lower than the English figure for 1920 (49·3 per cent.). The mortality depends much on the age of the patient, increasing with advancing years. As regards sex, the Belgian mortality was found to be higher in females. The clinical types of the disease were representative of those usually encountered, including examples of the myoclonic form. The authors noted in Brussels an undue incidence of polyneuritic cases of obscure ætiology occurring when encephalitis lethargica was prevalent. Without definitely pledging themselves to the identity of the two forms of disease, they incline to the view that in epidemic periods such instances of neuralgia and neuritis are due to the virus of encephalitis. Polyneuritic forms were met with in the English outbreak of 1918 associated with definite lethargic symptoms, but few have been reported since that date. In Belgium "epidemic hiccup" is regarded as a mild form of encephalitis lethargica. Out of the 200 cases of encephalitis lethargica intensively studied, 62 died of the malady. Among the 138 survivors, 104 were kept under observation for three and a half years. Of these 58 remained cured, 2 recently developed mental and ocular sequelæ, while 44 showed various mental, choreiform or paralytic after-effects. In this sad heritage, as in France, symptomatic paralysis agitans predominated, being declared in 27 cases. The sequelæ only appeared in young subjects or in adults under 50 years of age. As a rule, the mental or paralytic after-effects ensued on severe attacks of encephalitis; but paralysis agitans was only seen to follow mild cases of the acute disease or cases in which it was manifested without localising signs.

The value of the work here considered, which is published under the auspices of the Belgian Ministry of the Interior and of Hygiene, is enhanced by a complete and detailed review of the pathology of encephalitis lethargica, and critical attention is paid to the most recent researches on the subject, for example, those of Levaditi, Harvier and Nicolau, and the work of Perdrau in this country. The work is illustrated, and has both a complete index and a copious list of references.

MODERN ASPECTS OF SYPHILIS.

By M. J. HORGAN, B.A., M.B., Ch.B., B.A.O. N.U.I., late Resident Medical Officer, General Dispensary, Nottingham. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 136. 5*s*.

THIS little book is based on lectures and published works of Josef Kyrle, and on practical study of the methods and material of the Finger Clinic in Vienna and sets forth the standpoint of Finger and his co-workers. The greater part of the book deals with the importance of the changes in the cerebro-spinal fluid in syphilis and their value in diagnosis and treatment. The author insists on the necessity of examination of these changes and their proper interpretation as only by this means is there any hope of avoiding late neuro-syphilitic diseases as tabes and general paresis.

Obviously, in ideal conditions, the examination of the cerebro-spinal fluid should be done repeatedly but in most cases one examination only can be done and the importance of the timing of this examination cannot be exaggerated. In this book the time of election is considered to be the second or third year of the infection. This choice will not meet universal approval. In the matter of treatment intrathecal injections are condemned entirely—this is strong but probably justifiable. No mention is made, unfortunately, of treatment by intravenous medication followed by drainage of cerebro-spinal fluid—the method of reinforcement—and apparently this method does not find favour in Finger's clinic. The chapter on allergy and the luetin reaction is short but gives much food for thought. It is unfortunate that the writer has used a term "positive liquor"—it is not an accepted expression, and is likely to lead to confusion.

On the whole this is an excellent little book and will repay careful study.

DIAGNOSTIC METHODS.

Fourth edition. By H. T. BROOKS, A.B., M.D. F.A.C.P., Professor of Clinical Medicine, College of the Medical Evangelist, Los Angeles, California. London: Henry Kimpton. 1923. Pp. 109. 8*s*. 6*d*.

THIS book is distinguished from many of its kind by its brevity and its handy size and shape. Within the space of his 109 pages the author has managed

to compress a surprisingly large number of the methods of clinical diagnosis of which the need may be felt by the practitioner. He states it to have been his aim to confine himself to those procedures not requiring much apparatus or the expenditure of much time; this being the case, he was certainly well advised to omit descriptions of the more elaborate quantitative procedures, as, for example, the estimation of the blood-sugar, the calculation of the basal metabolic rate, and so forth. He was as certainly ill-advised to include details of the technique of the Wassermann reaction and of the complement-fixation test for gonorrhœa. The most complicated of the chemical tests are child's play compared to either of these, and the possibilities of error that lurk in both, and more particularly in the latter, are such as to render them both unsuitable for occasional performance by any busy man.

Apart from these last-mentioned procedures, the descriptions of the various techniques are clear, concise, and strictly practical—so free, in fact, is the book from theoretical considerations and general principles that one rather gains the impression that clinical diagnosis is simply a matter of pressing the button and getting the answer on a card. To counteract any such tendency, Dr. Brooks suggests that his book should only be used in conjunction with "some extensive work on clinical diagnosis." In this he is undoubtedly right.

DIE CHIRURGIE DES ANFÄNGERS.

By Dr. GEORG AXHAUSEN, A.O. Professor für Chirurgie in der Universität Berlin. Berlin: Julius Springer. 1923. Pp. 443. $4.50.

THIS book consists of lectures given by Dr. Georg Axhausen to his students in the University of Berlin. The lectures were intended for the beginner—that is, students commencing their clinical work—and as Dr. Axhausen says in his preface, "if students will read through the book in the holidays before they begin their clinical course, its object will have been fulfilled." The book is admirably adapted for the purpose. It does not deal with treatment, but only with methods of examination, and the deductions to be drawn from the signs found. Especially well described are the methods of examination of the hip-joint, and excellent diagrams are given to illustrate and explain Trendelenburg's sign, a useful and important test that is often omitted in text-books. There is a short chapter on minor surgery, such as the student is called upon to perform, including the necessary local anæsthesia.

Of its kind, this is one of the best books we have seen, and it might repay translation into English. The book is short and is easily read, and a student about to start work in the wards would find it an invaluable companion during his first surgical post, giving the solution to many problems and perplexities during his initiation into ward work.

TEETH, DIET, AND HEALTH.

By KURT H. THOMA, D.M.D., Assistant Professor of Oral Pathology, Harvard University Dental School. London: Werner Laurie. 1923. Pp. 226. 10*s*. 6*d*.

THIS book is public rather than scientific in its appeal, and it is highly desirable that the public should be instructed in the elements of the anatomy and pathology of dental disease, for its prevention, so far as our knowledge of its causation permits, rests with the public rather than with the professional hygienist. The book demands a modest standard of knowledge on the part of its readers, but it is clearly written in non-technical language. The statements are soberly expressed, while there is little to indicate, except in reference to various articles of diet not common in this country, that it is an American and not a British production.

We notice that Dr. Thoma uses the "slogan," a clean tooth never decays. In our view it is a somewhat misleading phrase likely to convey a false sense of security. Cleanliness in the sense implied is beyond the reach of the most thorough dental hygiene, while there are some puzzling anomalies; it is not uncommon to see mouths which are kept as clean as is possible, with many carious teeth, and others quite uncared for with entire immunity. To those who are under the illusion that dental conditions are better in the United States than in this country, it may come as a surprise to hear that dental disease is just as common. Statistics at the Mayo Clinic showed that 87 per cent. of patients suffered from infected teeth, while out of 846 children in Cleveland, only three were found with perfect teeth. Even English statistics do not show such a high incidence of dental disease as this, though possibly the American standards are higher. In an account of the evolution of the teeth we are told that the canines are formidable weapons in the boar, *elephant*, and walrus. The tusks of the elephant are, of course, incisors. We dissent from the statement that the first permanent molars begin to calcify ten weeks before birth. C. S. Tomes says that calcification commences in these teeth just before birth, and N. Bromell gives the date as one month before birth. Again, the statement that all the permanent teeth, with the exception of the first molar, commence to calcify after the first year seems to err in the other direction. All the authorities on dental anatomy agree that calcification of the incisors commences during the first year. It is interesting to note that the author holds that sugar does the greatest harm by attracting free lime salts in the body so that the teeth may be imperfectly calcified. Not every dietitian will agree with him that sugar is not a natural food and should have no place in the dietary.

If all parents studied this book the task of the dentist would be made easier. The chapter on Mouth Hygiene is full of practical details. The proper way to brush the teeth is illustrated by some good diagrams. In view of some recent correspondence in our columns, it is interesting to note that Dr. Thoma advocates brushing the gums as well as the teeth. The book is well printed and the illustrations are good. Altogether it is an excellent production.

THE PHYSIOLOGY OF MUSCULAR EXERCISE.

By the late F. A. BAINBRIDGE, M.A., M.D., D.Sc., F.R.C.P., F.R.S., Professor of Physiology, University of London. Second edition, revised by G. V. ANREP, M.D., D.Sc. Lond., Senior Assistant in Physiology, University College, London. London: Longmans, Green and Co., 1923 Pp. 226. 10*s*. 6*d*.

MOST physiologists are in agreement that the author of this work, one of the most gifted physiologists in the country, gave us in this book one of the best monographs on physiology ever written in any language. The early exhaustion of the edition gives further proof of this. In the present edition some nine pages of text have been added, there is one new figure, and the index has been improved. The added matter consists chiefly of references to English work by Hill, Lupton, Anrep and Cannan, Douglas and Haldane, and Barcroft. There are also references to the work of Krogh on capillary reactions and of Krogh and Lindhard on the respiratory quotient. Apart from these additions the editor has left the text as it stood, and in our opinion he has been wisely advised in this, for it could not well have been improved.

BLOOD CHEMISTRY, COLORIMETRIC METHODS.

For the General Practitioner. With Clinical Comments and Dietary Suggestions. By WILLARD STONE, M.D., Attending Physician, Los Angeles General Hospital, U.S.A. New York: Paul B. Hoeber, Inc. 1923. Pp. 75. $2.25.

THIS book gives a good account of the methods which are in use in the United States for estimating the non-protein nitrogen, urea, uric acid, creatinine,

sugar, cholesterol, and chloride, which are present in blood. In nearly every case the final determination depends on the use of a colorimeter. The description of the method is clear and concise, and will save the laboratory worker much trouble in looking up the original papers, the reference to which, however, is always given. Although many of the methods are not by any means too difficult for the practitioner to learn, the time factor may prevent his attempting to use them. The suggestion that an assistant could easily learn to carry out the technique is a practical one. A short account of the clinical value of the estimation is appended to each section, and these seem to be carefully considered. Some 20 pages are devoted to the question of dietary control of disturbances of metabolism. The most important part is that concerned with the acid and alkali content of the various foodstuffs, and tables are given showing the acid and alkali produced by different foodstuffs. Joslin's tables for the treatment of diabetes are given in preference to Allen's.

The book is typically American in many of its phrases, and some unusual words are used, but on the whole it reads easily. It should be of considerable value both to the laboratory worker and to the clinician.

WHY BE FAT?

By CECIL WEBB-JOHNSON, M.B., Ch.B., Major, R.A.M.C. (T.F.), late Civil Surgeon and Officer Commanding Station Hospital, Dum-Dum. London: Mills and Boon, Ltd. 1923. Pp. 174. 5*s*.

THIS book should find a ready sale among those who suffer from obesity—it is well and wittily written, and contains a great deal of useful matter. The advice given by the New York editor, to anyone wishing to get thin, "(1) eat everything you don't like, (2) do everything you don't want to," is by no means the correct treatment. The main lines recommended by the author are, to eat less of everything, and, what is equally important, to drink much less of everything, to sleep less, to take more exercise, to take cold baths, and generally lead as healthy a life as possible. The author condemns milk in such strong terms as to give the impression that he is the victim of an *idée fixe* on the subject. He even goes so far as to say that, in his opinion, milk is the chief cause of cancer of the stomach and bowel, besides being the commonest cause of dental caries and pyorrhœa. This violence is a defect in a book otherwise wholly sensible and well written.

THE FIGHTING INSTINCT.

By PIERRE BOVET, Litt.D., Professor of the University of Geneva, Director of the Jean-Jacques Rousseau Institute, Geneva. Authorised English Translation by J. Y. T. GRIEG, M.A. London: George Allen and Unwin. 1923. Pp. 252. 10*s*. 6*d*.

THIS book, by a Swiss educationist, was prompted by the European war, and the thought that the investigation of its immediate causes should give place to a more general inquiry. Certain truisms had assumed the authority of common sense: that man's pugnacity made wars inevitable; that political States regressed to infantile modes of behaviour, and let themselves go in outbursts of destructive anger; or that the future depended upon pacificist teaching. With these propositions as a starting point, Mr. Bovet makes a thorough examination of the fighting instinct in its different modifications and sublimations, and applies the teachings of modern psychology as a means of understanding human behaviour. He draws upon many writers, and gives the impression that he uses them not to find support for his own views, but for what he can learn from them. Unfortunately, the word "pacificist" has acquired a narrow and controversial connotation; but in the proper sense of the word all good citizens are pacificists, and few would wish to reject the conclusion that "The pacificist ideal is in the line of human development, such as this is shown to be in individual and social psychology."

The book is neither Utopian nor a sentimental plea for peace, but a scientific and practical exploration of the possibilities of so controlling our social heredity as to render possible a society of nations in which armed conflicts will no longer arise. The translator has done his work well, and the book deserves a wide circulation.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES, October to December, 1923.—Dr. John Thomson, of Edinburgh, contributes a paper on Peculiar Fatal Convulsions in four children, whose father suffered from lead poisoning, in which the chief points of interest are as follows: (1) All the children born after the father's lead-poisoning began were similarly affected, although the mother remained quite healthy; (2) the child whose case is described continued until near the end in excellent bodily and mental health apart from fits, and showed no signs of rickets, indigestion, mental dullness, or mental peculiarity; (3) the attacks were very different in their phenomena from ordinary infantile convulsions, affecting the respiratory apparatus specially and yet not resembling those in laryngismus or status lymphaticus.—In a paper on Severe Tuberculin Reactions, Scrofula, and Status Lymphaticus, Dr. Charles McNeil, of Edinburgh, states that in a small number of cases of tuberculous infection the tuberculin cutaneous reactions are remarkably severe. In the majority of these severe tuberculin reactions the type of lesion is that formerly described as scrofulous, and commonly includes a scrofulous or phlyctenular conjunctivitis. Dr. McNeil recommends that the term "scrofula" should be retained to describe those types of tuberculous infection which are associated with the status lymphaticus, and which in consequence exhibit an intensified reaction to the tubercle bacillus and its poisons.—Dr. Norman B. Capon, of Liverpool, reports a Case of Tuberculosis in Infancy to illustrate the diagnostic difficulties presented by tuberculosis at that age. He points out that though the condition may be strongly suspected when the child's mother is proved conclusively to be the subject of active tuberculosis, it has no definite symptomatology, pallor, wasting, enlargement of the liver and spleen being the most frequent findings. In Dr. Capon's case, in which death took place 41 days after birth, it was impossible to state definitely the route by which infection occurred, especially as the placenta was not examined histologically; but the advanced state of the lesions in the child's viscera was in favour of the infection having been intrauterine.—In a paper on Dilatation of the Aorta in Children Associated with Chronic Interstitial Nephritis Dr. J. H. Sheldon, of Wolverhampton, reports a case in which dilatation of the aorta in a boy, aged 10, was produced by the high blood pressure resulting from chronic interstitial nephritis. All other causes of aortic dilatation could be excluded such as syphilis, acute infections, congenital malformation, and arteriosclerosis. He alludes to a similar case reported by Evans, and states that in both cases the structure of the aorta post mortem showed very little departure from the normal, indicating that the dilatation was probably a mechanical consequence of the hypertension.—Dr. Angelica Panayotatou, of Alexandria, reports a cases of Typhoid Fever Complicated by Purpura Hæmorrhagica. The patient was a girl, aged 4, who on the fourteenth day of disease developed ecchymoses on the chest followed by epistaxis, melæna, and hæmorrhages from the ears. Various modes of treatment were employed without success, and death took place on the eighteenth day of disease.—The abstracts from current literature are devoted to nervous and mental diseases.—A very full index to the volume forms a useful guide to contemporary pædiatric literature.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

III.—STATUTORY OBLIGATIONS: HOW TO FULFIL THEM.

BY JAMES NEAL, M.R.C.S. ENG.,
GENERAL SECRETARY OF THE MEDICAL DEFENCE UNION.

It is an honour for a man to keep aloof from strife.
Proverbs xx. 3.

I AM convinced that most of the medico-legal difficulties met with in medical practice are preventable. Many are due to sheer carelessness or slackness, possibly to overlooking some small point which at the time seems unimportant, but which subsequently proves to be vital; some to a want of knowledge of the various statutes that directly affect a medical practitioner in the daily exercise of his profession. In some respects it is unfortunate that the teaching of law is not a part of the medical curriculum. A certain amount of law is taught to those who are training to become accountants, bankers, surveyors, and others, but it is a subject which is almost entirely neglected in the case of the medical student.

The General Medical Council.

Every medical practitioner should know the functions and powers of the General Medical Council; the privileges and obligations which he acquires by the act of registration; his responsibilities in the treatment of his patients; and his duties with regard to certification of all kinds. The Council was established by the Medical Act of 1858. It consists of 38 members. Essentially it is a council of education and registration. It exercises supervision over the various qualifying bodies, and it prepares and publishes the Medical Register. No matter what medical diplomas or degrees a man may have obtained, he is not legally entitled to style himself doctor or surgeon, or to practise as such in this country until his name has been entered on the Medical Register.

The Council has no control whatever over unregistered practitioners, but, by virtue of its power to erase from the Register the name of any medical practitioner adjudged guilty of "infamous conduct in a professional respect," it exercises a disciplinary control over the medical profession. In such cases it is the sole judge of all questions of fact, and there is no appeal from its decision on a question of professional conduct arrived at after due inquiry at which the accused person has had a full opportunity of being heard, and of which he has received due notice. The Council cannot take evidence on oath, it has no power to compel the attendance of witnesses, and it cannot award any costs.

Registration and its Effect.

The medical student who passes his final examination and obtains a degree or diploma should register before he commences any kind of professional work. The procedure to effect registration consists merely in forwarding an application to the Registrar of the General Medical Council* with the statutory fee of £5 1s., and this should be done at the earliest moment possible after becoming qualified. Once registered, it only remains for the practitioner to keep the Registrar notified of any change of address, and to reply to any formal inquiry which he may receive from the Registrar as to the correctness of the entry of his name and address in the Register.

By the act of registration the practitioner acquires certain privileges and certain obligations. He becomes entitled to practise medicine, surgery, and midwifery in the United Kingdom, and, subject to any local laws, in any other part of the British Empire. He can sue for fees, unless he is a Fellow of the Royal College of Physicians, in which case he is prohibited by by-law from recovering at law his expenses, charges, or fees. He can fill public medical appointments. He can sign medical certificates in certain cases, including lunacy (if in practice), death, vaccination, and other statutory certificates. Whilst he remains in practice he is exempt, if he so desires, from serving on juries. It is necessary, however, that his exemption should be claimed when the lists are revised, for if his name is included in the lists he will be liable to serve.

The obligations to the State which devolve upon a registered medical practitioner may be placed under seven headings.

1. *Notification of Births.*

A medical practitioner who is in attendance upon the mother at the time of, or within six hours after, the birth of a child, must give notice in writing of the birth to the medical officer of health of the district, unless he has reasonable grounds for believing that notice has already been duly given by some other person. The practitioner should therefore ascertain whether the father or nurse has given the required notice, and, if not, he should send the notice himself. Too often this precaution is neglected, with the result that, owing to the default of others, the practitioner finds that he is held to have committed an offence, and rendered himself liable to a fine. All births after the twenty-eighth week of gestation must be notified, whether the child was born alive or dead. A stillbirth of less than 28 weeks' gestation need not be notified. No charge can be made for the notification of births.

2. *Death Certification.*

In the case of any person attended during his last illness by a registered medical practitioner, that practitioner must sign and give to some person, required to give information concerning the death, a certificate stating to the best of his knowledge and belief the cause of death. When the practitioner has not actually seen the dead body, and is consequently not in a position to testify as to the fact of death, he should invariably insert the words, "as I am informed" in the certificate. No fee can be charged for furnishing the statutory death certificate, though any additional certificates of death required by the relatives may be charged for. Any death certificate required under the Friendly Societies Act must be a "certified copy" issued by the Registrar of Deaths, and not a duplicate copy of the statutory death certificate signed by the attending practitioner. The statutory death certificate cannot be refused on the ground that the practitioner's account for professional services has not been paid.

3. *Inquests.*

An inquest must be held when "there is reasonable cause to suspect that a person has died either a violent or unnatural death, or has died a sudden death of which the cause is unknown." In any such circumstances the practitioner should refuse to give a certificate and should inform the coroner of the facts. If the practitioner is informed that his presence will be required at the inquest, he should insist upon being served with a subpœna, as otherwise he will not be able to enforce his claim for his fee. No fee is payable to a medical witness at an inquest on the body of a person who died in a public institution, if it was the duty of the medical witness to attend the deceased person as medical officer of the institution. When a medical practitioner has reported a death to the coroner, there is no legal obligation upon the practitioner to give any further information until he is on oath in the witness-box, but as a matter of courtesy it is customary to answer any questions put by the coroner or his officer. No fee can be demanded for information given in such circumstances.

* 44, Hallam-street, London, W. 1. The address of the Registrar of the Branch Council for Scotland is 20, Queen-street, Edinburgh, and that of the Branch Council for Ireland, 35, Dawson-street, Dublin.

4. *Notification of Infectious Disease.*

It is the duty of every medical practitioner attending on or called in to visit a patient, on becoming aware that the patient is suffering from an infectious disease scheduled under the Act, forthwith to send to the medical officer of health for the district a certificate stating the name of the patient, situation of the building, and the infectious disease from which, in the opinion of the medical practitioner, the patient is suffering. Similar notifications must be sent to the Chief Inspector of Factories, Home Office, London, in the case of lead, phosphorous, arsenical or mercurial poisoning, or anthrax, contracted in any factory or workshop. It is customary in urgent cases to notify infectious diseases by telephone so as to secure the earlier removal of the patient to an isolation hospital. In all such cases the written statutory notification should also be made at the earliest moment possible, and neglect of this precaution frequently leads to difficulties.

5. *Evidence in Court.*

A medical practitioner may be required to give evidence in court. Such evidence is privileged to the extent that no civil action will lie against him in respect thereof, but not in the sense that he can refuse to disclose information obtained in his professional relations with his patients. A medical witness who is asked a question which he can only answer by a breach of professional confidence, should appeal to the judge as to whether he is compelled to give the information. If the judge tells him to do so, he must either obey or take the consequences, which may involve a committal for contempt of court. It is conceivable that in some cases a doctor's conscience would not allow him him to give the required evidence. All honour to those who in such circumstances steadfastly refuse to betray a professional confidence. But in many of those cases where privilege is claimed no breach of professional confidence is really involved, as no pledge of secrecy was given or implied.

In criminal cases the amount of the fees to be paid to professional witnesses is fixed by regulations made by the Home Secretary in 1904, modified to the extent of a 50 per cent. increase by the Witnesses' Allowances Order of March 1st, 1920. In civil cases in the High Court the fees allowed vary according to the professional standing of the witness, and in addition he is entitled to his reasonable travelling expenses, but the witness usually arranges with the solicitors as to the amount of his professional fee. The arrangement should be made beforehand, and a written undertaking to pay the agreed amount should be insisted upon. In default of this, it will frequently be found that the solicitors will refer the witness to their clients for his fee, when disappointment may result.

6. *Dangerous Drugs Regulations.*

These regulations impose important obligations on medical practitioners in the matter of keeping specified records of all supplies received, and of all drugs dispensed, which come within the Act. So far as is necessary for the practice of his profession, a duly qualified medical practitioner may be in possession of dangerous drugs. He may supply them by personal administration or by administration under his direct supervision, and he may dispense them for the use of his patients, except that he may not supply raw opium to a patient. A prescription for a dangerous drug:—

(i) Must be in writing and be dated.
(ii) Must be signed with the usual signature of the prescribing doctor.
(iii) Must bear the address of the prescribing doctor (except in the case of prescriptions issued under the National Health Insurance Acts).
(iv) Must state the name and address of the patient.
(v) Must state the total amount of the drug to be supplied on the prescription.

A messenger sent to take delivery of a supply of drugs must be given an authority in writing, signed by the doctor, to receive the drugs on behalf of the doctor. Except in the case of drugs administered by himself personally, a doctor who dispenses or supplies medicines is under obligation to keep the registers of purchases and supplies in the prescribed manner. All registers and other records, and any stocks of drugs held, must at all times be available for inspection by any duly authorised inspector.

Since the introduction of the Dangerous Drugs Act, medical practitioners frequently find some difficulty in deciding the extent to which they can prescribe dangerous drugs for persons addicted to morphia or other drug habits, without rendering themselves liable to have their conduct called in question. It must be assumed that a medical practitioner is entitled to prescribe whatever drugs he conscientiously believes are necessary for the proper treatment of a patient, but when the amount of a dangerous drug which he is disposed to order is in any way excessive, he will be well advised to insist that the amount shall be decided in consultation with a colleague of repute.

7. *Certification in General.*

The quasi-official status accorded to the registered medical practitioner gives him certain privileges in certifying as to his opinion with regard to the physical or mental condition of his own or others' patients. This privilege must be exercised with due care. A medical practitioner may be held liable for injury caused by his neglect to make proper inquiry before signing certificates. A certificate also, if signed maliciously and without reasonable cause, might be held to be a libel upon the person to whom it relates. In the ordinary way the High Court does not accept a medical certificate as evidence, but requires personal testimony from the medical practitioner. A medical certificate must always be regarded as a document of great importance and the practitioner should only certify what he is prepared to affirm on oath.

A HUNDRED YEARS AGO.

From THE LANCET *of Jan. 18th, 1824.*

HOSPITAL REPORTS.

GUY'S HOSPITAL (Jan. 16).

Amputation at the Hip Joint.

This formidable operation was performed here this morning, for the first time, by Sir Astley Cooper in the presence of some of the surgeons and pupils belonging to these institutions . . . the femoral artery, being tightly compressed at the groin by an assistant (Mr. Key), Sir Astley, standing to the outer side, with the limb in the one hand, and the catlin in the other, commenced the operation, by making an incision just below Poupart's ligament, a little to the iliac side of the femoral artery; this was continued obliquely downwards and outwards to the back of the thigh, about one-third of the way down, from which point the knife was carried in the opposite direction, obliquely upwards and inwards to meet the first incision, by this means, forming an elliptical curve; at this step of the operation, the femoral artery was divided, to which a ligature was immediately applied; the cellular membrane was merely cut through at first, but the knife was again carried in the same direction as before, and thus the muscles were also separated; at this step also, it was necessary to apply another ligature on the inside of the limb; here the operator changed positions, and sat on a chair in front of the patient, and waited a short time to see whether there were any bleeding vessels; after the lapse of a few minutes the operation was continued and very shortly completed, the head of the thigh-bone being removed from the acetabulum without any difficulty; two ligatures in addition to those already used were applied, making in the whole four; the integuments were brought together, and a suture applied to the upper portion; strips of adhesive plaster, and lastly a bandage were put over the stump. There were about 12 ounces of blood lost, but it had the appearance of being venous. The limb was removed in the space of twenty minutes, the securing the arteries and dressing occupied fifteen more . . . During the operation the man was extremely faint, but some wine being given him, and fresh air admitted, he recovered. The patient bore the operation with extraordinary fortitude, and after all was finished, he said to Sir Astley, "that it was the hardest day's work he had ever gone through," to which Sir Astley replied, "that it was almost the hardest he ever had."

THE LANCET.

LONDON: SATURDAY, JANUARY 19, 1924.

IMMUNISATION AS A BUSINESS PROPOSITION.

AMERICA is alive to the social value of health. Dr. C. E. FORD, president of the American Association of Industrial Physicians and Surgeons, has recently[1] dwelt on knowledge acquired from industrial investigations; he shows not only how there is a constant ratio between length of employment and physical soundness, but how the sickness rates of the general community and infant mortality are affected by earnings. A sickness rate of 70 per 1000 accompanied a wage of less than $12 per week, but it fell steadily as wages increased until it became only 18·5 for a wage of $20 or more; while an infant mortality of 137·8 went with yearly incomes of $1050, but was only 89·4 for incomes of $1850. The figures are striking, and indicate the enormous importance of real wages to public health and of the study of medical sociology. This country is falling back both in the practice and study of preventive medicine as a money-making concern.

In a well-known American periodical, *Munsey's Magazine*, an advertisement has been appearing regularly in recent numbers. The Metropolitan Life Insurance Company of New York finds it worth while, in the full-page advertisement referred to, to draw attention to the risks of diphtheria and the advantages of immunisation by toxin-antitoxin mixtures. This company, it is stated, "is making every effort to teach mothers that this disease is entirely preventable, and urges them, as well as others in charge of children, to take no chances with diphtheria." Between 1911 and 1922 the death-rate from diphtheria of children insured in the company declined 34·1 per cent. and is still lower in 1923, and it is only reasonable to assume that this improvement is due, in part at least, to an increasing appreciation of the importance of early serum treatment and to the consequent immunisation of very large numbers of children in all the great American cities. In advocating the general application of the Schick test and of the toxin-antitoxin method of prophylaxis the advertisement asserts that "experience shows that both test and treatment are painless and harmless," a claim which will be endorsed, so far as young children are concerned, by those who have employed the method in this country.

It is to be regretted that Great Britain has fallen so far behind the United States in this matter of diphtheria prevention. During the war the medical profession was too over-worked to undertake any investigations which had no direct bearing on that great struggle, and as a result it was not until 1920 that the first account of work done on the Schick test in Great Britain, a paper by Dr. H. MASON LEETE, appeared in these columns. America had a long start and now, after nearly ten years' work, is achieving wonderful results. New York expects to immunise 100,000 children of school age, and 20,000 under school age, in the coming year. Dr. W. H. PARK reports that the death-rate from diphtheria per 100,000 inhabitants has fallen from 22 to 15 in the last four years, and work as extensive and effective has been undertaken in many of the States. To compare with this we have little to show in this country, although Dr. R. A. O'BRIEN and his colleagues have worked energetically at the subject and their published results have doubtless encouraged others to make a trial of prevention methods. Some of the large fever hospitals have taken up the question, and we understand that in those of Aberdeen and Edinburgh all nurses are now protected, the results so far attained having been most encouraging. In both cities, moreover, the departments of child welfare have started immunisation, but much propaganda work will be necessary before parents and directors of institutions see the advisability of imitating America. For their persuasion advertisements of the type of that of the Metropolitan Life Insurance Company might be effective. The company certainly would not advertise unless firmly convinced that it was a paying proposition, and thoughtful parents and guardians, who might be inclined to regard immunisation as a medical fad, are likely to be impressed by such outside testimony. The pioneers of diphtheria prevention in this country, however staunch their patriotism, must regard the enterprise of this and other American insurance companies with envy, and heartily wish that by some process of inoculation or otherwise they could induce our own to copy the methods.

[1] Journal of Industrial Hygiene, December, 1923, v., 279–287.

THE GUINEA-PIG AS INDICATOR.

THE last issue of THE LANCET contained an article, by Dr. E. H. KETTLE, on the Criteria of Cure in Tuberculosis of the Guinea-pig, which is of special importance at the present moment when large numbers of experimental tests of various antigens and chemotherapeutic remedies are being made. Dr. KETTLE wisely points out that guinea-pigs are as a rule experimentally infected purely for diagnostic purposes, and not with the object of studying the whole process of disease in this particular animal. Having obtained what they require—viz., unequivocal evidence of tuberculous infection, most laboratory workers are not further concerned with the trend of events in the animal, any more than a chemist who obtains a precipitate in a test tube is concerned with the physics of the phenomenon of precipitation. But it appears clear that if the guinea-pig is to be used as a test animal for the assessing of anti-tuberculosis remedies, much more precise observation on the march of events in the infected animal is needed.

Dr. KETTLE points out that two false assumptions appear to underlie much of the evidence which is produced in original papers dealing with this matter: (1) That all guinea-pigs react in the same way to the tubercle bacillus, and (2) that fibrosis or healing of local lesions indicates with certainty the cure of the individual. When the evidence is sifted, as it is by Dr. KETTLE, it is obvious that these assumptions are, indeed, erroneous. In the first place the duration of life in the infected guinea-pig varies very considerably and there is every reason why it should. Probably the path of the infection is not always quite the same in each case, since the inoculating needle in penetrating different planes may cause the dose of tubercle bacilli to get past certain superficial glandular lines of defence. This point has recently been brought to notice in a careful piece of work by Prof. S. LYLE CUMMINS,[1] on the infection of guinea-pigs by the conjunctival instillation of tubercle

[1] Tubercle, January, 1924, p. 153.

bacilli. In this article the writer states that the susceptibility of guinea-pigs to the subcutaneous inoculation of tubercle bacilli is too great to allow of the employment of this form of infection in immunity experiments with virulent strains, and suggests per-conjunctival infection as a more precise method of greater delicacy. If subsequent research be found to bear out Prof. CUMMINS'S observations, it may provide us with at least one possible explanation why subcutaneously infected animals survive for different periods of time even when other factors have, as far as possible, been standardised. Secondary infection is also a possibility which, in our opinion, is not sufficiently allowed for. It is not uncommon to find a tuberculous guinea-pig dying several weeks before its time, whilst the tuberculous lesions are still slight, from what is obviously a secondary infection. Recently an accidental filter-passing infection invalidated a series of experiments on lymphadenoma in rabbits.[2] Again, it is not unlikely that differences in the dietary obtaining in different laboratories at different times of the year, and with varying methods of feeding, may have a bearing on the matter, for it is clear that we are not yet at the end of our troubles with regard to vitamins and infective disease. And yet another possibility must be considered—viz., the hereditary factor in the strain of the animal used. This point appears to have been largely neglected in this country, but a brief reference[3] to it at the eighth annual congress of the National Association for the Prevention of Tuberculosis by Dr. PAUL A. LEWIS, of Philadelphia, who has investigated the question in collaboration with the United States Department of Agriculture, would suggest that the breed is not without influence in regard to susceptibility to infection.

Nor can the weight of the guinea-pig be regarded as an adequate test without further control. Young animals will continue to grow for some time after inoculation with *B. tuberculosis*, and it is not unknown to find such animals heavier at death than at the time of inoculation. For an obvious reason, also, female guinea-pigs should never be used for such experiments, since pregnancy is difficult to diagnose. Individual guinea-pigs differ in their histological response to infection with tubercle bacilli. Palpable glands may diminish in size even in untreated animals, and fibrosis and natural healing may occur in guinea-pigs infected with tubercle bacilli without any form of treatment at all. And finally we have to reckon with the fact that, so far, no one has succeeded in estimating the toxicity of different strains of tubercle bacilli, and that different laboratories are in the habit of using different strains cultivated on media of varying composition. Thus we realise how thorny a path the investigator has chosen who sets out to test an anti-tuberculosis remedy on the guinea-pig. The proposition may be by no means impossible, but there is need of a far more careful standardisation of the conditions of the experiments.

[2] C. C. Twort and H. E. Archer, THE LANCET, 1923, i., 1102.
[3] Tubercle, 1920, ii., 84.

THE LIMITS OF A SURGEON'S LIABILITY.

A SOUTH AFRICAN correspondent referred recently[1] to an action brought by a Miss VAN WYK against Dr. H. LEWIS on the ground of alleged negligence in leaving in her body a swab, after operating on her for certain diseased conditions of gall-bladder. The case was tried at Queenstown by Mr. Justice VAN DER RIET, evidently with great care, and the principal reasons which led him to give judgment in favour of Dr. LEWIS are worth recapitulating. It may first, however, be stated that the fact of the swab having been left in the patient's body by the surgeon when he closed the wound was disputed. The patient's story supported by witnesses was that the wound had discharged and it had otherwise caused her suffering during the year that followed the operation, and that the swab had appeared in a stool passed at her home on Feb. 15th, 1923, the operation having been performed on Feb. 3rd, 1922. After this period of time the defendant and his witnesses, not unnaturally, could not recall details of the counting and checking of swabs on the occasion in question, and could only speak as to the routine usually adopted at the Frontier Hospital, Queenstown, and admit that the checking was done by the theatre sister present, when the patient's condition had rendered urgent the completion of the operation. The defendant and medical witnesses on his behalf were not able to say that the manner in which the swab was stated to have come to light was impossible, but only that it was improbable, and that its appearance did not bear out the plaintiff's story. The theatre sister, however, gave positive evidence that the swab produced was not one that she had ever used, as it was different in size and other respects from those made by her. As to this important point, however, the judge was sufficiently impressed by the manner of the plaintiff in the witness-box, to hold that her story was true and that the theatre sister must be mistaken. His judgment therefore was based upon the fact, found by him as a preliminary, that a swab had been left behind in error, from which it followed that a mistake in checking must have been made by the sister and not discovered by the surgeon, who, as far as he was aware, had removed all the swabs used.

In these circumstances a number of points had next to be considered. In the first place the judge ruled that the leaving behind of a swab was prima facie but not conclusive evidence of negligence. He then had to decide whether a custom or practice had been proved that in operations the theatre sister or other assistant should be responsible for checking the removal of anything under her charge that should be removed before closing the wound. As to this, he held that such an alleged custom need not be shown to be universal. A surgeon charged with negligence was only bound to establish that he employed reasonable skill and care, and from this it followed that if he adopted a system recognised and used by skilful and careful surgeons, which he reasonably considered satisfactory from his experience, it was not necessary to show that it was the most perfect system or one approved by universal practice. As to what had actually taken place the judge was satisfied that, when the operation had been brought to a conclusion after the anæsthetist had called attention to the patient's condition, "the defendant, as far as the exigencies of the case would allow, had made a careful search and was undoubtedly under the impression that he had removed all the swabs." It had been contended that the surgeon had neglected his duty to the plaintiff in not counting or supervising personally the counting of the swabs before, during, or after the operation. After hearing the opinions of many witnesses, he declined to accede to this view, and attached weight to the opinion that to do as was suggested might distract the attention of the surgeon to the patient's detriment. It had been argued that if not personally responsible for the counting, the surgeon was liable for what the sister did, either because she was his "servant" or because he was a "joint tort-feasor" with her. Carefully reviewing their respective positions and duties, he held that in what the sister did she was "a member of a team collaborating with the surgeon"; he would only be liable for her act or omission if it was due to an order or instruction given or omitted by him. He referred in this connexion to the case of Hillyer v. the Governors of St. Bartholomew's Hospital,[2] and to the earlier case of Perionowski v. Freeman[3] decided by Chief

[1] THE LANCET, Jan. 5th, p. 47.
[2] (1909) 2 K. B., p. 820.
[3] 4 F. and F., p. 977.

Justice COCKBURN in 1866, as well as to "Beven on Negligence."[4] The defendant and the sister could not be held to be joint tort-feasors, as they could not in any way be said to have been jointly engaged in any wrongful act.

It will be seen from the above summary that the case, like others of its character, offered many difficult points for consideration, and Dr. LEWIS is to be congratulated upon having successfully defended himself against a serious charge of negligence, arising out of an accident such as only occurs because, in the words of Judge VAN DER RIET, "no system has yet been devised by which the element of human fallibility can be eliminated." He was also perhaps fortunate in that his case was tried by a judge in accordance with the law and with good sense, and that the element of sympathy that sometimes affects the verdict of a jury and makes for injustice was thus eliminated. As it was, a bitter attack on the conclusion arrived at is quoted from a Bloemfontein newspaper in the *South African Medical Record*, and answered with the vigour it deserves by our contemporary. It includes the statement that "the fact that a medical practitioner cannot be held legally responsible for such an occurrence will be read with amazement by common people." This, of course, is untrue, for the judge expressly laid down in his judgment, quoting from "Beven on Negligence," that leaving a sponge or an instrument in a patient after an operation is prima facie negligence, but that the fact that it is so left is not conclusive. "The conclusion from the fact must be determined by a jury on a view of the whole circumstances." The public, from which juries are drawn, should realise that in the thousands of operations which take place annually the most anxious care is exercised by the surgeon, and by those who assist him, to prevent any occurrence such as Judge VAN DER RIET found took place in the case before him.

THE PSYCHOLOGY OF ÉMILE COUÉ.

DURING his visits to this country Mr. Coué found both admirers and scoffers but few hostile critics. In the current *English Review* an American writer, Dr. Emil Axel Gibson, makes a vigorous attack upon his methods and, pointing out their connexion with hypnotism, sketches their dangers with a heavy pencil. To Dr. Gibson the "will" of the hypnotist is an entity that can enter the mind of another and do strange things therein, and by the power of his will the mental healer can play upon the moral, mental, and physiological consciousness of his subject, as an electrician, by connecting his wires with the batteries of his system, can light every lamp or sound every bell within the ramifications of the connecting lines. A hint of mysterious power lies in the information that in cataleptic disorders "an association with outside mental control over the freedom of will cannot be doubted." This points to bewitchery and prepares us for the conclusion that "the situation is grave enough to call for a warning against practices which may lead to the greatest tragedy that can happen to human nature—the collapse of individuality and the debasement of will." But the danger is not so great as Dr. Gibson fears. Medical psychologists show no signs of being perturbed by the popularity of Mr. Coué, an enthusiast whose charming and paternal manner arouses in his subjects a feeling of delightful dependence that enables them to put aside their neurotic troubles. Perhaps his cures are neither complete nor lasting, but neither he nor any other mental healer possesses the malign powers ascribed to him by Dr. Gibson.

[4] Third edition, p. 1161.

WE regret to announce the death, at Exeter, on Jan. 11th, of Mr. Arthur Charles Roper, oculist and hon. consulting surgeon to the Royal Devon and Exeter Hospital. He was in his sixty-sixth year.

Annotations.

"Ne quid nimis."

THE GENESIS OF GALL-STONES.

PATHOLOGISTS to whom text-book orthodoxy is anathema will read with much interest a paper on the genesis of gall-stones, published in German, by Prof. T. Rovsing, of Copenhagen, in *Acta Chirurgica Scandinavica* (Vol. LVI., Fasc. 2 and 3, pp. 103 and 207). For the past 30 years he has been systematically collecting material wherewith to refute the teaching of Naunyn and others that a gall-bladder must be infected before stones can develop in it. In this period 530 cases of gall-stones were operated on, and in every case a bacteriological examination was made under aseptic precautions at the time of operation. In some cases the bacteriological examination of the contents of the gall-bladder was supplemented by a microscopic examination of a section of its walls and by a bacteriological examination of the interior of the gall-stones. It was found that the contents of the gall-bladder were sterile in 314 cases and infected in 216. In no case in which the bile was sterile could germs be found within the gall-stones, and in only one of the 530 cases was it impossible to demonstrate a core of pigment in the stones. The youngest patient was a child, barely one and a half years old. In this case the bile was sterile, and the common bile-duct was obstructed by a quantity of coal-black grit. There was no sign of any inflammatory reaction, and Prof. Rovsing suggests that this early case gives a valuable clue to the genesis of all gall-stones.

As a result of this prolonged study Prof. Rovsing is inclined to believe that gall-stones all begin as a small nucleus of pigment which forms the core of the stone. Sepsis is, in his opinion, a sequel, not a cause, and he dismisses as untenable the ingenious suggestion that an infected gall-bladder may become sterile after the development of a stone, the germs supposed to be responsible for this development slipping unobtrusively away after the mischief was done. His argument in opposition to this teaching hinges on an analogy. In no case of calculus of the bladder with infection of the urine has sterility been achieved without removal of the calculus. It is, therefore, improbable that a septic gall-bladder should automatically become sterile so long as it harbours a gall-stone. Sepsis should therefore be regarded as a sequel—a very serious sequel—to the development of gall-stones, and not as a cause thereof. Prof. Rovsing ridicules the notion that facets are produced on gall-stones by their pressing on each other under the spasmodic clutch of the gall-bladder. Facets, he suggests, are the expression of the intrinsic properties of the constituents of certain gall-stones, and he notes that in the urinary bladder the oxalate stone is spherical, while the urate stone is a flat oval. He has also noticed that when gall-stones are multiple, they are usually of the same size, and that it is very rare for more than two or three different sizes to be found in the same bladder even when it contains many hundred stones. This observation suggests that all the stones of the same size found in a gall-bladder were formed at the same time, and Prof. Rovsing believes that the period during which a crop of gall-stones is created must be quite short. He suggests that the core of a gall-stone is always, or nearly always, formed in the intra-hepatic biliary passages by the precipitation of black pigment chalk, the process being determined by a transitory "diathesis" comparable with the periodic precipitation of uric acid, uric acid salts, and calcium oxalate in the kidneys.

Two other observations deserve special mention. It has been suggested that ptosis of the viscera, notably the liver and stomach, favours the development of gall-stones by obstructing the biliary passages. Among the 300 cases operated on for gastro-coloptosis by Prof. Rovsing during the past

25 years, there were only eight in which gall-stones were found at the time of operation. Further, among the 530 patients operated on for gall-stones, there were only 18 women and one man suffering from gastro-coloptosis. The poor state of general nutrition of ptotic patients may give a clue to their comparative immunity from gall-stones, which are most common in fat persons. The other observation is also instructive. Among 30 cases of chronic biliary obstruction and jaundice coming to operation, and 32 coming to necropsy, there was not one showing the slightest evidence of gall-stones, whether the chronic jaundice was associated with sepsis or not. In other words, prolonged biliary stasis with jaundice does not evidently promote the development of gall-stones.

LEPROSY IN PARIS.

THE danger of leprosy spreading in Paris is by no means negligible at the present time, for at least 200 lepers have drifted there from foreign countries. Prof. M. E. Jeanselme recently demonstrated to the Academy of Medicine [1] a case of macular leprosy in a young man of 16 years who had contracted the disease in Paris. The patient was born in that city, where he had resided all his life. His father, an ex-marine, had served abroad in Guiana and Cochin China, and in 1913 developed leprosy—that is, eight years after his return from abroad. The mother of the leprous youth remains perfectly healthy. There can be no question in this case of hereditary transmission of the disease, for at the time of the birth of his son the father was perfectly healthy; on the other hand, it is probable that the disease was transmitted from father to son by actual intimate contact. The author points out that in the Hospital Saint Louis, where lepers have been segregated in one room for very many years, no case of contact infection has so far been recorded, but here is an infection contracted in the family circle in a spot far removed from any endemic focus of the disease. Unfortunately this is by no means a unique case of contact infection by leprosy in Paris; at least three similar cases have been recorded since 1885. In view of this evidence, Jeanselme urges the Permanent Leprosy Commission to study anew the prophylactic measures to prevent the spread of leprosy in France.

THE NERVOUS COMPLICATIONS OF PARATYPHOID FEVER.

ACCORDING to Dr. G. Artom,[1] assistant at the Clinic of Nervous and Mental Diseases of Rome, who records an illustrative case, nervous complications apart from meningeal involvement are uncommon in paratyphoid fever. Schottmüller reported a case of epileptiform attacks in a girl, aged 20, who had not previously suffered from epilepsy, but was of an irritable and eccentric disposition. Cases of tetany have been recorded by Bedos, Babonneix, Corone, Bossert, and Vincent and Muratet. Examples of hemiplegia have been related by Cestan, Descomps, Euzière, and Sacage who attribute it to cerebral arteritis. Schürer has described a case of dysarthria, which he attributed to hæmorrhagic inflammation of the bulbar nuclei, and Etienne has reported a case of permanent spastic paraplegia. Bingel has published a case of spastic paresis of the limbs without involvement of the facial nerve, and regarded the condition as due to acute encephalitis, and Goston and Schett have related a case of cerebral abscess in paratyphoid B infection. Dr. Artom's case was in a neuropathic female infant, aged 13 months, who developed paratyphoid B fever, accompanied by psychical disturbance in the form of alternate drowsiness and restlessness. The restlessness disappeared, but the drowsiness became more pronounced, and severe nervous symptoms developed in the form of conjugate deviation of the head and eyes to the right, slight nuchal rigidity, and generalised clonic movements. Lumbar puncture gave issue to an abundant clear fluid containing a slight excess of albumin and lymphocytes, with a few polymorphonuclear cells. The clonic movements and nuchal rigidity disappeared in a few days, and spastic left hemiplegia developed. This condition lasted until the temperature became normal on the twenty-ninth day of disease when rapid improvement began, and in another fortnight complete recovery took place. The symptoms in this case were probably due to a toxic impregnation of the cerebral cells and meninges, possibly accompanied by slight vascular infiltration and œdema. Severe vascular lesions, such as arteritis, thrombosis, or hæmorrhage, were excluded by Dr. Artoun, as they could not have cleared up so quickly.

[1] Bull. de l'Acad de Méd., 1923, xc., 395–397.
[1] La Pediatria, 1923, xxxi., 545.

FOOD AND DISEASE IN THE TROPICS.

DURING his long service in the Navy Sir P. W. Bassett-Smith had constantly to deal with the practical application of dietetic principles and the fruits of his experience are manifest in an address which has now been reprinted.[1] Just as in civil life the ultimate result of a deficient dietary is to produce civil disobedience and political unrest, so, in former times, bad rations fomented open mutiny in the Navy, as in the reign of George III. In the tropics the maintenance of a balance between the intake and output of heat should be the main consideration underlying the dietary, so that the ration supplied to naval ratings in the Persian Gulf has to be based upon a different scale from that supplied in more temperate climes. The value of protein in the dietary should depend largely upon the amount and kind of amino-acids which it contains, two only of which—tryptophane and lysine—appear to be indispensable for life. The greater the similarity of the protein supplied to the tissues, the higher is its value; hence the biological protein value of meat and milk is three to four times as great as that of maize. In the tropics people tend to rely more particularly upon one kind of food—e.g., rice, maize, bananas, manioc, figs, or dates—for the maintenance of life, and this very dependence on one particular product tends to produce, in times of scarcity, malnutrition and susceptibility to disease. The lecturer showed how the dietaries of the several navies when compared showed considerable variations, those of the United States giving the highest caloric value, the French and Japanese showing much lower fat values than those of the British and Americans, more in conformity with tropical conditions. Tropical heat has a depressing action upon many physiological processes, lessening the respiration rate, and with it the absorption of oxygen and the excretion of carbonic acid, resulting in retention within the body of CO_2 with production of glycosuria and acidosis. In addition to the basic supply of protein, fats, carbohydrates, and salts, accessory food substances—the vitamins—or "food hormones" are essential to health. Sir P. W. Bassett-Smith concluded by directing attention to the experiments on guinea-pigs which showed that animals fed on a diet rich in vitamins, such as marmite, exhibited an enhanced resistance to tuberculous infection as compared with a control series fed on a normal dietary.

[1] Presidential address on the Relation of Food to the Causation of Disease in the Tropics, Trans. Roy. Soc. Trop. Med. and Hyg., 1923, xvii., 223–244.

RECURRENT ATTACKS OF INFANTILE PARALYSIS.

THE germ of infantile paralysis is generally supposed to confer immunity to a second attack. Attempts have often been made to reinfect monkeys which have contracted experimental infantile paralysis, but these attempts have always failed. The reason for this failure is probably to be found in the researches

Levaditi, Flexner, and Lewis, who have demonstrated in the blood of persons recovering from this disease substances capable of neutralising its virus. During the epidemic of 1916 in New York two cases were, however, reported, in which more than one attack occurred in the same patient. In *Le Scalpel* for Nov. 17th, 1923, Dr. Gaston Peremans has recorded a case in which the disease recurred in three successive waves. The patient was a girl aged 4 years and 9 months. On her admission to a children's hospital in Boston, U.S.A., in July, 1920, there was a history of drowsiness and morning vomiting for the past six weeks. The vomiting had become more severe during the past 15 days, and during the last week there had been attacks of convulsions, the first of which had lasted one or two minutes, the second 20 minutes. Since then she had been very weak, groaning when she raised her hands to her head. In hospital she cried when she was touched, the reaction of the pupils was very slow, there was slight cervical rigidity, and Kernig's sign was positive on both sides. The preliminary diagnosis of tuberculous meningitis was unsupported by the evidence of lumbar puncture, and she was discharged from hospital with the diagnosis of anterior poliomyelitis. She was re-admitted to hospital in October, 1920, with the history that for three months she had been well in spite of morning vomiting accompanied by abdominal pain and drowsiness. Eight days before admission to hospital incessant biliary vomiting began, and she complained of pain in the left lumbar region and the right half of the head. Four days later she could not move her limbs, and she screamed when her head was touched. Passive movements of the legs were painful, and the left leg showed a flaccid paralysis. The left arm was weak, and the movements of the left side of the chest were less ample than those of the right side. Pirquet's reaction was negative, and no tubercle bacilli could be found in the cerebro-spinal fluid. About two years later a third attack occurred, being characterised by anorexia, vomiting, and pain. It was less severe than the previous attacks, and on this occasion areas which had been almost intact were involved. The arms were painful, and the wrists assumed a position of permanent flexion. Slight atrophy of the dorsal muscles of the hands developed. Re-examination of the cerebro-spinal fluid failed to show any sign of a tumour of the cord. Dr. Peremans suggests that the immunity conferred by the first attack must have been so transitory that reinfection occurred.

BLOOD URIC ACID IN SKIN DISEASES.

AT the last meeting of the American Dermatological Association Dr. Jay Frank Schamberg, director, and Mr. Herman Brown,[1] chemist of the Research Institute of Cutaneous Medicine, Philadelphia, read a paper on the blood uric acid in diseases of the skin with particular reference to eczema and pruritus, based on the analysis of the blood of 280 persons. They remark that there has been a tendency on the part of American writers on dermatology to pay little or no attention to the relationship of gout and eczema, which has always been emphasised by French dermatologists and to some extent by specialists in this country, especially Tilbury Fox. Although there is no unanimity at present as to what constitutes the maximum normal for uric acid in the blood, the writers are of opinion that it is about 3·7 mg. per 100 c.cm. of blood, estimated by which standard 44 per cent. of their 161 cases of eczema and 50 per cent. of 10 cases of pruritus showed an excess of uric acid in the blood. The type of eczema in the main associated with excess of blood uric acid was the erythematous form, although the vesicular and other types were represented. On the other hand, in psoriasis, urticaria, acne rosacea, acne, and other cutaneous diseases the percentage of cases of hyperuricacidæmia was strikingly less than in eczema. Age appeared to exercise a considerable influence on the quantity of uric acid in the blood. The highest uric acid values were found between the ages of 40 and 80, and decidedly lower rates were observed between 15 and 40. The rise in uric acid, however, as age advanced, was much more obvious in patients with eczema than among those with non-eczematous dermatoses. The influence of sex was shown by the fact that the average amount of uric acid in the blood was 3·6 per 100 c.cm. among 167 male patients as compared with an average of 2·7 mg. among 140 female patients; among eczematous subjects the average of 95 male patients was 3·9 mg., and of 69 female patients 3 mg. In several cases the writers made a determination of the uric acid in the scales thrown off the skin. While the method was less accurate than the determination of blood uric acid, the results were suggestive. There appeared to be a relationship between the blood content and the scale content, but the amount of uric acid in the scales was higher. Patients with an excess of blood uric acid were placed on a diet from which meat, fish, fowl, internal organs, and meat soup were excluded. Eggs and milk were allowed, as they yielded no purin products. On the whole, the results were very gratifying, though in some instances dietetic treatment was disappointing.

[1] American Journal of Dermatology and Syphilology, December, 1923.

COMBINING RADIUM EMANATIONS WITH FAT.

Prof. J. Strasburger,[1] of Frankfurt, reports the results of experiments to increase the availability of radium emanations by using fat as the vehicle of transport instead of water. He has previously published several articles showing that the effect on the tissues of the body increases with the increase in the quantity of radium emanations introduced, but unfortunately the quantity of radium available is generally too small to allow of the use of such large doses, and therefore he seeks to find a way of increasing the availability of the radium without increasing the dose. Radium emanation is, as is known, a gas, which can be dissolved in water, and which is readily given off from the latter into the air, where it diffuses. Introduced into the body it diffuses through the lung capillaries into the expired air. Chemically the emanation is combined neither inside nor outside the body as "Edelgas." Prof. Strasburger's idea is to make a stronger physical combination with the emanation than has hitherto been done in order to retain it longer in the body, and so make its availability greater. He gives the coefficient of solubility of emanations in air and water (given equal volumes of both, and taking the coefficient of air = 1·0) as water at 20° C. = 0·25; water at 30° C. = 0·20; water at 40° C. = 0·16. Various paraffins and fats dissolve more radium—e.g., vaseline will dissolve nine times as much radium as air, and therefore 36 times as much as water at room temperature, while olive oil dissolves 28 times as much as air or 112 times as much as water. These facts have been made use of by Prof. Strasburger both for external application and for internal administration.

For External Application.—In baths containing emanations it is only the thin layer covering the skin that has any action, for the α rays penetrate only to a depth of 1/10 mm. and the β rays only to a few centimetres. Prof. Strasburger therefore recommended that the action might be strengthened by substituting for the baths packs of emanation water, enveloped in an airtight covering, to prevent the diffusion of the emanations into the air, but even so the emanations very rapidly diffused off. He found that by dissolving the emanations in vaseline and applying it in the form of an ointment to the skin the rate of diffusion into the air was very much diminished. The difference between water and fat solutions when free access to the air is allowed is shown by a graph. The thickness of the enveloping sheet of emanation-containing substance naturally influences the rate of diffusion. Whereas with a thickness of 15 mm. of water 55 per cent. of the emanations are present after 15 minutes, in vaseline of the same thickness 90 per cent. are still present at the end of an hour, and with a thickness of 2 mm. only 20 per cent. are retained in water after the

[1] Deutsche med. Wochenschrift, Nov. 30th, 1923.

first minute, while 38 per cent. remain in vaseline after an hour. If the air is cut off by an airtight covering, the concentration available for therapeutic use is still further increased. A solution of emanations in fat produces in another way a greater therapeutic effect than a solution in water; for while it is true that with water packs or baths the emanations diffuse to a certain extent into the body and are given off in the expired air, this action is very limited, as the water remains on the surface of the skin and only very slightly penetrates into the pores. On the other hand, the ointment penetrates through the sweat pores and hair follicles deeply into the corium, and the epidermic cells themselves take up the fat (as can be demonstrated by the fact that many substances can be found in the urine after applying them to the skin). Therefore even when the layer of ointment is removed from the surface, a certain amount remains behind, and the action of the emanations continues for some hours. One may assume that the emanations reach the nerve-endings, and by virtue of their lipoid solubility may be retained and stored in the nerve sheaths. It is also possible that they may travel (similarly to tetanus toxins) along the sheaths to the central nervous system. In this way Prof. Strasburger explains the effect on trigeminal neuralgia of emanation ointment applied to the face. He has used this application with increasing success in such cases, and finds that the pain is relieved after daily application continued for a few days up to two to three weeks, suggesting that the time taken may be necessary for the emanations to travel up the nerve sheaths to the Gasserian ganglion.

Internal Administration.—If a watery solution of emanations is taken by the mouth the emanations pass into the portal system and into the right ventricle. While passing through the lung capillaries most of the emanations are given off into the alveolar air, and only a very few reach the systemic circulation. If the solution is taken on an empty stomach the expired emanations reach a maximum in a few minutes, then sink, first rapidly, and later more slowly, until in about 50 minutes no more are given off. When taken on a full stomach, the quantity of expired emanations does not reach such a high point, but remains for a longer time at a medium height and only sinks slowly till zero is reached in about two and a half hours.[2] Thus in the first case an intensive action of short duration is present, while in the second a weaker action of longer duration is obtained, and this, in considering the therapeutic effect, is an important point. If the therapeutic value is required not only of the α rays, which come off first, but also of their breakdown products, the β and γ rays, which are found later, then it is clear that it is of the utmost importance to retain the emanations in the body for as long as possible, and in this direction Prof. Strasburger has conducted his experiments. With his co-workers, Dr. Vaternahm[3] and Dr. Möhrle, he has shown that if an olive oil solution is taken internally, the emanations are retained in the body for a longer time than when a watery solution is used. This is true with an empty stomach, and still more so with a full one. With oil taken on a full stomach it is over six hours before the expired air is free from emanations. This phenomenon may be explained as follows: (1) fat leaves the stomach more slowly than water, and therefore absorption from the intestine is delayed; (2) in virtue of their high solubility in fat, the emanations are only slowly given off in the intestines to the surrounding fluid; the rate at which the emanations are absorbed from the intestines depends upon their solubility in the products of fat digestion—namely, fatty acids and soaps; for if their solubility in the latter substances is less than in neutral fats, then a proportion will be set free and will rapidly diffuse into the tissues, while that quantity of emanations which are soluble in fatty acids and soaps will remain dissolved for a time proportionate to the coefficient of solubility for these substances. Experiments are still being carried out to determine this coefficient, but it has already been shown that the coefficient for fatty acid is approximately the same as that for neutral fats, while that for soap is considerably higher than that for water.

All the foregoing facts taken together point to an increase in the absorption time as compared with water. But is the increase in the time of the expiration of the emanations into the air accounted for alone by the increase in the absorption time? The problem of retaining the emanations in the body has been half solved by Prof. Strasburger by increasing their solubility, and he has thus succeeded in retaining them longer during their transit from the mouth to the intestine and during their absorption into the blood, but the next question is more difficult—that is, whether after absorption into the blood, the physical combination with fat has any further effect and can carry them past the lung capillaries (where most is expired) into the systemic circulation in greater quantity than is otherwise the case, for it is only those emanations that have passed through the lungs that reach the joints, muscles, nerves, connective tissue, &c.—in short, those places where their healing powers are needed. The answer to this question can be approached in several ways. We can follow in imagination the emanations, dissolved in oil, passing from the intestine into the thoracic duct and so into the venous blood-stream, the quantity of the blood depending on the fat content of the latter, and consequently increasing after a meal, more especially if such be rich in fats. The emanations then pass through the capillaries of the lungs, where most is given off into the alveolar air—but not all. That this is so is demonstrated by experimental estimation of the total quantity of emanations given off in the expired air. Such estimations have been carried out, and Prof. Strasburger has also, in order to eliminate any loss of emanations during their passage from the mouth to the intestine, introduced them direct into the duodenum. The result of these experiments shows that of 3000 M.E. (Maché units) in water, 69 per cent. are recoverable in the expired air, while from the same quantity dissolved in 20 c.cm. olive oil 56 per cent. are expired. Thus the quantity retained in the body and otherwise transformed or excreted is 31 per cent. and 44 per cent. respectively.

Further experiments consisted in injecting a fine emulsion of emanation-containing oil into a vein and measuring the expired emanations. A graph shows the quantity expired during the first minute, using water and varying quantities of oil, and indicates that the greater the quantity of fat introduced the less the amount of emanations expired. Experiments with much larger quantities of oil up to 250 c.cm. are still in progress. The last link to be discovered is the quantity of emanations present in the arterial blood, and investigations on this point are being undertaken. The conclusions that Prof. Strasburger draws from his work are: that it is possible to bring a larger quantity of radium into action, not only by increasing the dose, but by increasing the availability of the emanations; and that this object is attained by taking advantage of the fact that emanations are more soluble in fat than in water.

[2] Keman and Neumann: Zeitsch. für Baln., 1910–1911, No. 17; Strasburger: M. w. W., 1911, No. 15; B. kl. W., 1912, No. 9. [3] Zeitschr. f. physik. diät. Ther., 1922, xxvi., 261.

WORKMEN'S COMPENSATION IN 1922.

REMARKABLE figures as to miners' nystagmus are a feature of the Home Office statistics [1] of compensation and proceedings under the Workmen's Compensation Act of 1906, and the Employers' Liability Act, 1880, for the year 1922, just issued. In the figures of industrial diseases, cases of miners' nystagmus amount to 68 per cent. of the total number. This disease was first scheduled in May, 1907, under Section 8 of the 1906 Act. Figures for the years from 1908 to 1922 are now available. In 1908 386 new cases were recorded. The total climbed over the 1000 mark in 1911, and passed the 2000 mark in 1913. In 1914 there were 2775 new cases; in 1919 and 1920 this figure was but slightly varied. The three months' stoppage in the mining industry in 1921 may have been a reason why the total of new cases sank to under 2000 in that year. In 1922, however, the figure has made a startling jump up to 4092.

Other points of general interest in the report are the statistics illustrating the increasing recourse to the services of medical referees. There is power under Article 15 of Schedule II. of the 1906 Act for committees, arbitrators, and judges to refer cases to medical referees. In 1922 208 cases were thus referred in England, and 80 in Scotland. Under Article 5 of the same schedule (which has since been altered by the 1923 Act) a county court judge can summon a medical referee to sit with him as assessor. This was done in 465 cases in 1922. Under Article 15 of Schedule I. recourse is had to medical referees (by

[1] Cmd. 2007. H.M. Stationery Office. 1923. 6*d*.

agreement between the parties) for certificates of the condition of the workman and of his fitness for employment, or for decision whether and how far his incapacity is due to the accident. This was done in 1224 cases in 1922 as against 655 cases in 1921. Finally, under Section 8 (1) (*f*) of the 1906 Act there is an appeal to medical referees against the decision of a certifying or other surgeon in giving or withholding a certificate of disablement on account of industrial disease. There were 1049 such appeals in 1922 as against only 479 in the previous year. It is perhaps worth noting that in as many as 387 out of the 1049 appeals the surgeon's decision seems to have been overruled. The annual statistics relating to medical referees will be affected in future years by the new provisions of the 1923 Act and by the various new regulations made on Dec. 17th of last year.

Two other matters of interest are the decrease in litigation under the Acts and the slight increase in the proportion between payment of compensation and cost of insurance. As is well known, there are many who advocate as a political measure the handing over to the State of all insurance against workmen's compensation and employers' liability. They point, on the one hand, to the low figure of administrative cost in countries where the State has undertaken the monopoly of its own insurance system. On the other hand, they show that where such insurance is left to private enterprise, the insurance companies have to spend (in competition with one another) so much money on offices, advertising, canvassers, and so on, that a considerable sum is wasted upon overhead costs which might otherwise be given to increased benefits. The position in 1922 shows some improvement here. In 1921 the proportion of income allocated to payment of compensation by insurance companies was only 35·95 per cent. In 1922 it was 44·46. In future years the proportion will be higher still, the big accident insurance companies having entered into a self-denying arrangement with the Home Office that the figure shall be not less than 60 per cent. in future, with the possibility of still further improvement.

A HEALTH SURVEY OF A CHICAGO PRISON.

THE American system of health surveys is proving its utility, throwing rays of light into many a dark corner. The Chicago Bridewell would seem, from a report [1] of one of these health surveys, to be a dark corner indeed. The survey was initiated by the Municipal Tuberculosis Sanitarium. Altogether 1181 inmates were examined, 784 being stripped and exhaustively examined for non-tuberculous as well as tuberculous conditions. The ratio of whites to blacks was as 70 to 30, and 136, or 11·5 per cent. of the total, were found to be tuberculous. In 79 other cases there were uncertain signs of tuberculosis, and only 966, or 81·9 per cent., could be regarded as non-tuberculous. Dental caries was found in 675 cases, and pyorrhœa in 400. The examining physicians reported that the mouth condition in this class was the worst they had ever seen. The great majority of the prisoners had from two to eight old rotting stumps, often associated with pyorrhœa and inflamed or ulcerated gums. Obviously the dental service at this institution was inadequate, and it is urged by the examiners that the opportunities neglected in this prison must sooner or later be paid for by a large crop of destitute invalids suffering from chronic rheumatism and heart disease for which the community must pay for an indefinite period. "It is cheaper," they remark, "to pay one full-time dentist now than to support hundreds of incurables a few years from now." Five hundred of the prisoners suffered from chronic pharyngitis, and 20 from hernia. The most representative criminal in this prison was the petty thief or pickpocket, whose small, under-nourished, anæmic frame obviously rendered him incapable of doing a day's physical work even had his cravings pointed in that direction. "It seems probable that an individual of this type is, in many instances, a pickpocket from necessity rather from choice. . . . He must thieve or he must starve." The report on the general hygiene of the prison is a damning indictment. "They are not taught hygiene, and they do not live hygiene. They are locked in their cells at 4.30 in the afternoon and remain locked up till 6 or 7 next morning. Of the 1600 inmates, 1000 live in cells, often two to a cell, in which there are no toilet facilities. Two-gallon cans without covers are supplied in lieu of toilets. The physical discomfort and moral degradation of this arrangement, even to those whose sense of common decency is far from keen, may well be imagined. It is only fair to state that the superintendent of the institution has tried for years to secure better health conditions at the Bridewell, but without avail." There is much more to the same effect in this stinging indictment of a state of affairs which carries us back to the barbarism of the Middle Ages. Incidentally this report shows how difficult it may be to carry reforms from within, however anxiously the officials of certain institutions desire them.

[1] Bulletin, City of Chicago Municipal Sanitarium, Nov. 1923.

BLOOD GROUPS AND OPSONINS.

THE excessive number of variables which come into play in the opsonic technique has, for a majority of workers, proved a fatal obstacle to the gathering of useful information from the determination of opsonic indices. In a short paper, which we publish in our present issue, Dr. F. C. Martley has drawn attention to yet another complicating influence. He has found that under similar conditions, in the case of an individual belonging to blood group ii., the corpuscles appear to be more active in phagocyting tubercle bacilli than those of individuals of two of the other blood groups —viz., iv. and iii. Making a larger series of experiments with a number of individuals, he finds that an increased phagocytic ability is apparently inherent in the leucocytes of persons belonging to group ii. These observations are interesting and worthy of a more extended investigation. It also appears to us that, from his initial experiment, Dr. Martley might equally reasonably argue that with the same corpuscles a group ii. serum seems to be more active in exciting phagocytosis than that of the other groups, and that the serum factor is deserving of investigation as well as the corpuscular one; in this respect the influence of agglut nation may come in. It might be expected that where corpuscles are in the presence of a serum which contains iso-agglutinins for the group to which they belong, that marked differences of opsonic power would be noticed relative to what occurs between homologous serum and corpuscles from surface alteration of the corpuscles, but in the single experiment in which one can search for evidence upon this point we find no such variation. The investigation is an interesting one, and points out an as yet unconsidered factor to be reckoned with in opsonic determinations.

THE PRACTICE OF MEDICAL GYMNASTICS.

Two addresses recently delivered to the Chartered Society of Massage and Medical Gymnastics emphasise the intimate relation in which this branch of practice stands to medicine. Dr. J. B. Mennell's lecture appears substantially in full on another page; the time now seems remote when, as he reminds us, a deputation of his fellow house officers waited upon him to request him not to degrade his profession by studying such a doubtful branch of medical practice. During the 15 years which have elapsed since then, Dr. Mennell has learnt many things, to do and not to do: among them, that it is far easier to rub a disability into a patient's mind than it is to rub it out of his limb; and, on the other hand, that in every joint, with the solitary exception of the hip-joint, it is possible for the gymnast to perform some movement not ordinarily under the patient's voluntary control. Sir William Milligan's "Founders" Lecture,

delivered last Monday to the Society, opened with an interesting historical summary of medical rubbing from the earliest times. He recalled the aphorism of Hippocrates that "soft rubbing loosens; much rubbing causes parts to waste; moderate rubbing makes them grow." The competent masseur of to-day is not only a trained manipulator and rubber, but has become also a physico-therapist and to some extent a psycho-therapist, with the art of imparting hope and encouragement to his patients. So long as the present excellent and comprehensive training is insisted upon and so long as no extravagant claims are made, Sir William Milligan regards as certain the medical gymnast's hold on the respect of the medical profession and the gratitude of the public. In orthopædic surgery the best end-results can hardly be obtained without recourse to mechano-therapy; effleurage is now begun almost at once in the case of that very common injury, a sprained ankle; massage soothes in some degree the dreadful paroxysms of pain in tic douloureux. Turning to his special department, Sir William Milligan laid stress on the need for instituting massage in middle-ear disease the moment facial paralysis or weakness becomes apparent, for the facial musculature is peculiarly prone to rapid degenerative change; in the condition known as boxer's or footballer's ear, immediate massage may avoid the deformity, so likely otherwise to be permanent. In building up the muscle tonus in general, the masseur is thereby increasing the effort and endurance of the heart itself. Without thorough grounding in anatomy and physiology, however, he can hardly set out to correct the many postural defects which are the result of faulty bodily mechanics. In conclusion, Sir William Milligan emphasised again the long and careful preliminary training required for proper appreciation of the therapeutic value of massage and physical exercises.

DR. ALBERT ABRAMS.

THE death is announced from San Francisco of Dr. Abrams, whose name was in recent years associated with so-called electrotonic reactions. He was born there in 1863, graduated in medicine at Heidelberg in 1882, and after further study in London, Berlin, Vienna, and Paris returned to San Francisco, where he became professor of pathology at the Cooper Medical College and in 1904 president of the Emanuel Polyclinic. At this period of his life Dr. Abrams was a prolific writer on clinical topics, his published works including a Manual of Clinical Diagnosis (1894), Transactions of the Antiseptic Club (1896), Nervous Breakdown (1901), and Spinal Therapeutics (1909). He then took up the subject of spondylotherapy, and presided over an association for its study. His electro-tonic work developed into an elaborate system of diagnosis and treatment which was considered by scientific medicine to be devoid of any basis, and on this point considerable evidence is now forthcoming. A correspondent of THE LANCET, recently travelling in the United States, has prepared a report for our columns, which will appear shortly. The necessity for publication is felt particularly by medical men in the United States, where the theories of Dr. Abrams appear to have obtained some hold, largely owing to the credulity of prominent laymen.

WE learn that Dr. D. E. Derry, professor of anatomy at the Government Medical School in Cairo and a well-known anthropologist, has been charged with the examination of the mummy of Tut-Ankh-Amen, and that Sir Archibald Reid's coöperation will be available for the X ray technique. Calcified ova of bilharzia have before now been found in mummified kidneys, and calcification of the arteries seems to have been one of the commonest of diseases in the time of the Pharaohs, affecting both young and old. What else the examination may reveal is a matter for intelligent speculation, but nothing is likely to miss the combined efforts of anatomist, anthropologist, and radiologist.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LIV.—TREATMENT OF THE ACUTE MENTAL CASE.[1]

ACUTE DEPRESSION AND ACUTE EXCITEMENT.

Acute Depression.

A CONSIDERABLE degree of depression may have existed unrecognised or misdiagnosed before the acute phase of the condition makes the diagnosis of "melancholia" clear. The management of a case of melancholia is a very large and sometimes a complicated question, but the immediate home treatment, which is largely symptomatic, is clear enough in certain important respects, and must be instituted without delay. By far the most important point is the fact that probably all acutely depressed patients have suicidal impulses at one time or another during the illness, and many have them constantly. There is only one safe rule in this matter: *Never* allow the patient to be out of the sight and immediate care of some responsible person. Neglect of this rule will sooner or later result in that greatest of tragedies, the needless death of a recoverable case. Inasmuch as the majority of suicides occur in apparently convalescent cases, the practitioner will be well advised never to relax this precaution, which should be taken the moment melancholia is suspected, without obtaining a second opinion. Commonsense measures, such as having the patient's rooms on the ground floor, removing sharp knives, knitting-needles, door keys and the like will suggest themselves and are important. Many a patient has committed suicide at leisure behind the locked door of a bathroom or water-closet, the attendant having acceded to the patient's plausibly expressed desire for privacy. A discussion of the question of suicide with the patient is perfectly good practice, and is often of great help in making the position clear. The view that, by doing this, one "puts the idea into the patient's head" is entirely fallacious.

Finally, it may be said that the vast majority of melancholics are honest with their physician and themselves, in the sense that when they say definitely and unequivocally that they are now well and have no intention of attempting suicide, they are to be believed. A convalescent patient who only goes the length of saying he thinks he ought to be all right now, or words to that effect, should in general be regarded as still very far from well. Next to the preventing of suicide, the cardinal points in the treatment of acute depression are: rest in bed (in the open air if possible), attention to the gastro-intestinal tract, which is invariably disordered, treatment of the sleeplessness, which is a constant feature, and relief of the patient's bodily restlessness and mental suffering. Physical improvement precedes mental, and the variations in body-weight make an excellent index of progress.

Opium has long been recommended as the best physical and mental calmative, and Battley's solution is a favourite form for its administration, but it is doubtful if it has any great effect in most cases, unless pushed to unwisely large narcotising doses. Calcium salts have been much tried and praised of late years, and some believe that very small doses of sulphonal (5 gr. twice daily) are of use in taking the edge off acute depression. The results are usually disappointing whatever drug is used. For actual sleeplessness, paraldehyde is best and may be given in doses of from 2 to 4 drachms the very last thing at night. As its effects are apt to wear off in the early morning, in a really sleepless case it may advantageously be given along with some drug which is

[1] An article on the treatment of Acute Delirium appeared in the last issue of THE LANCET.

slower but more sustained in its action. Seven to ten grain doses of veronal are much used for this purpose. Constipation is usually most troublesome to combat, and refusal of food as the result of various delusions, or as an attempt at suicide by starvation is unfortunately only too common. Even commoner is a process of slow starvation due to the patient eating something, but not nearly enough, at every meal. Tube feeding must be resorted to without undue delay, and the patient rarely raises any great objection.

Reassurance rather than argument is the keynote of correct dealing with the patient's mental distress. His fears and delusions did not arise out of, nor will they be removed by, any process of logic. While occupation and interest are the patient's great mental needs, yet the process of "rousing" and "cheering him up" is often much overdone. Inability to respond to emotional stimuli is of the very essence of the patient's illness. For this reason, too, unwillingness to "add to the patient's depression" by telling him, for example, any bad family news during his illness is needless. Such news will upset him less than at any other time.

Acute Excitement.

Severe but manageable excitement is commoner than an outburst of really acute "raving" mania. The condition is marked by emotional exaltation and rapid flow of ideas with greatly increased activity of body and mind. The more acute the excitement the more obvious is the impaired power of attention and the lack of control. In a really acute case the flow of ideas is so unchecked, and the power of attention and control so completely removed that the patient is completely incoherent and incapable of any continuity of thought or fixity of purpose. For this very reason, however, many such cases are, if anything, less troublesome to treat than those not quite so ill, who retain sufficient directive power to attempt to give effect to their unsound judgments and mistaken ideas. Maniacal patients are highly distractible and the ease with which their thoughts, speech, and actions can temporarily be diverted from one channel to another by a tactful and ready-witted companion is an important factor in treatment. Even the mildest cases, however, tend to remain noisy, interfering, argumentative and obstreperous, and are a source of great trouble whether at home or in a mental hospital.

The commonest error in the everyday management of such patients is an undue "humouring" of them by those who have to do with them. To show timidity in the presence of such a patient or to assent to his most outrageous statements with a would-be soothing, but obviously artificial "yes, yes," is apt merely to increase his emotional exaltation and aggravate his condition. Far better results are obtained by a tactful appeal to the patient's boisterous enthusiasm, his sportsmanship, his sense of fair play, and so on. Only in the most acute cases will such measures altogether fail. Many physicians, unfortunately, have at one time or another had to adopt similar measures with persons in certain stages of alcoholic intoxication, and indeed the resemblance, from this point of view, between the two states is very considerable. In many cases the excitement is far more evident in speech than in action, and vice versa, and in dealing with the patient advantage can often be taken of this fact. Many a patient in considerable excitement will remain comparatively quiet in a room, or even in bed, if he is provided with an ample supply of writing materials with which to produce innumerable letters and drawings. Others again will be perfectly quiet if given opportunity to walk vigorously about the garden, while others will sit motionless in bed talking incessantly. A case of any real severity should be kept in bed, if at all possible, though this is often a very difficult task, and it may sometimes, as indicated above, be wiser to allow the patient to be up. The patient's impaired power of attention makes it impossible for him to give due regard to his clothing, his appearance, or even the ordinary calls of nature without constant supervision and control. The physical state of such patients suffers very much less than might be expected. Short irregular intervals of rest and sleep seem to suffice for the time being to prevent a serious degree of exhaustion, and a parallel state of affairs exists as regards food. This is frequently refused altogether or ignored owing to the patient's inability to attend to it for long enough, but the majority of patients take sufficient at one time or another to make tube feeding unnecessary. The way in which a meal is presented to the patient often decides whether it will be hastily gobbled up or flung on the floor.

The best drug for sustained excitement is, without question, sulphonal, properly given. Sulphonal is almost insoluble in cold water, and if given thus or mixed with solid food it is an uncertain, cumulative, and highly dangerous drug. In boiling water, however, it has a solubility of no less than 1 in 15, and though this, of course, rapidly decreases as the temperature falls, it remains quite considerable at body temperature. The drug should be dissolved, therefore, in boiling water, not less than 1 oz. to every 4 or 5 gr. of sulphonal, some vehicle, such as milk or alcohol, added and the mixture drunk hot. Given thus, its administration can be continued for weeks at a time, if the patient's bowels are kept well open, without fear of unpleasant toxic effects. The dose depends upon the patient's condition. At first it may well be 20 or 30 gr. a day, in three doses, but thereafter the patient can generally be kept sufficiently under the effect of the drug by doses totalling 15 gr. in the day or even less. For sudden, uncontrollable outbursts of excitement morphine and hyoscine must be given (gr. $\frac{1}{4}$ with gr. $\frac{1}{75}$). Hyoscine alone, in spite of its marvellous efficacy in certain instances, is too unsafe and uncertain a drug to be recommended for the home treatment of an acute case.

Heroic doses of calomel used to be held in great esteem in the treatment of acute excitement. The writer has little experience of the method, but there is considerable evidence that the drug has a distinctly sedative influence, apart from that produced by the profuse purging which it brings about. Some authorities believe in the administration of croton oil. The continuous warm bath is probably one of the best means of treating acute excitement, but, though quite possible, it is rarely easy or convenient to adopt this measure in a private house.

General Points

If a mental case of any acuteness is to be treated at home, the physician should insist upon at least two trained and qualified mental nurses being engaged, one for day and one for night. Nursing help from members of the patient's family is almost never satisfactory, though it may often be made use of to relieve the nurse for meals and time off duty, a matter for which provision must be made one way or other.

Mental patients are invariably much more difficult to manage, from the nurse's point of view, in their own homes than in a hospital, and, in addition to this, the nurse will not improbably meet with difficulty as the result of the fussiness, suspiciousness, or nervousness of the patient's relatives. The physician owes it to the nurses to give them the very fullest measure of support and to ensure that they have full authority in his absence, and are safeguarded from interference. The instructions he issues to them and the reports he receives from them should be more than usually detailed and explicit.

Two great practical requirements for the physician treating an acute mental case at home are: ability to use sedative drugs wisely, and readiness to resort confidently to tube feeding at the proper time. A working knowledge of the lunacy laws will save the practitioner much trouble, and the ability to talk to, and deal with, mental cases, generally speaking, as if they were ordinary sick people, is perhaps most of all to be coveted.

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Special Articles.

THE CAPITATION FEE FOR INSURANCE PRACTICE.

Further Session of the Court of Inquiry.

The Court of Inquiry appointed by the Minister of Health to determine the capitation fee payable to insurance practitioners as from Jan. 1st, 1924, resumed its sittings on Jan. 8th in the Ministry of Health. The members of the Court are Mr. R. T. Hughes, K.C., chairman, Mr. F. C. Goodenough, and Sir Gilbert Garnsey.

Tuesday, Jan. 8th.

Mr. E. J. Strohmenger, C.B., Accountant-General to the Ministry, referred to the amended figures for cost of living in 1923 which Prof. Bowley had prepared on the suggestion of the Ministry. The new figures showed a fall in the cost of clothes and food, but they still showed an increase in the cost of fuel and light, although the Department were advised that there had been no change. Personal expenses and the cost of household supplies had also fallen since 1920, but Prof. Bowley's figures did not show this. Even on the doctors' calculations a fair comparison between 1920 and 1923 showed a fall in a comparable standard of living which was certainly no less than the fall in the Civil Service bonus. The Department were of opinion that the Civil Service bonus test was the fairest to apply; it involved no contentious assumptions as to the standard of living. The Ministry had made no pre-war comparison; no one could say what was the pre-war value of the present services required from insurance doctors. The only firm figure was the 11*s.* of 1920.

Prof. Bowley, questioned by Dr. Brackenbury, said that although, at the request of the Ministry, he had prepared alternative figures for 1923 he regarded his original figures as more valid and considered that the altered conditions affecting the doctor's budget for 1923 should be taken into account.

The Experience of Insurance Committees.

Mr. E. R. Abbott presented the case of the National Association of Insurance Committees and the Association of Insurance Committees for Wales. He said that the National Association of Insurance Committees had been formed in 1913. Section 31 of the National Insurance Act, 1913, authorised insurance committees to pay a subscription as part of their general expenses towards the funds of such an Association, and his Association, which represented 118 committees, could therefore claim to speak with an authority which was recognised by Act of Parliament. Of the members of every insurance committee three-fifths represented insured persons who were members of approved societies, the remaining two-fifths represented doctors or chemists or were appointed either by the local authority or by the Minister. The principal duty of the insurance committee was to administer medical benefit under the Insurance Acts; if anyone had authority to speak on the character of the medical service given to insured persons it was they, for they were in continual touch both with the doctors and the insured persons.

The Association had sent a questionnaire to all insurance committees; the Christmas holidays had delayed matters, but in spite of that, replies had been received from 24 county and 48 county borough committees. The replies stated unanimously that the service given by insurance practitioners had been faithfully rendered. In considering the complaints which were sometimes alleged against the medical service, it was often not sufficiently realised that the doctors not infrequently had very difficult persons to deal with. His insurance committee (Middlesex) had, since 1920, been called upon to investigate only 13 cases of irregular certification and 7 of these had been dismissed.

The Rev. William Dennis Yoward, President of the National Association of Insurance Committees, gave evidence in support of the replies given by the individual insurance committees. He explained that the Association had been in session in October when the question of the 1924 capitation was being considered, and the executive council had been authorised to take any action which might become necessary in connexion with that matter. In his experience the insurance doctors had carried out their duties in a proper spirit; his own medical service subcommittee had had only one case of negligence and one case where the doctor had tried to charge fees improperly; there had been similar experience in other districts.

Replying to questions by the Chairman on the specific points raised in the questionnaire, witness agreed with the unanimous expression of opinion that the contracts made by insurance practitioners, taken as a whole, had been faithfully rendered, and that the service was such as might reasonably be expected of average general practitioners. He agreed with the view generally expressed by the committees that there had been an improvement in the quality of the insurance medical service since the inception of the National Insurance Act; as regards diagnosis and treatment there had, in his opinion, been considerable improvement. He also thought there had been a great improvement in the medical service as compared with the facilities available in pre-insurance days. He considered that, with one or two exceptions, insured persons receive as good a service as is rendered to private patients in similar positions. He agreed with the views of the committees that the doctors had not taken unfair advantage of their right to claim that certain services did not fall within the terms of their contract; his experience showed that the doctors had not only fulfilled their contract, but had often gone beyond it without asking for special payment. He agreed with the almost unanimous opinion of the committees that doctors were not reluctant to visit cases needing treatment at home.

In reply to Sir Gilbert Garnsey, Mr. Abbott stated that the total number of insurance doctors for England was just over 12,000, and the number of insured persons 12½ million.

Sir Gilbert Garnsey said that from the complaint figures given by Mr. Brock on the previous day it appeared that on the average one insured person in every 12,000 complained once every four years—this seemed a very small number.

The Chairman: An amazingly small number.

Mr. Edwin Potts, hon. secretary of the Association, said that he fully agreed with the evidence of the Rev. Yoward. In his experience the average insurance doctor did not, before rendering a doubtful service, inquire whether he was obliged by his contract to do the work; he gave the insured person the treatment which his condition required. The returns from 81 committees showed that since 1920 there had been only 456 questions raised with regard to the range of service, although there had, during the same period, been 2369 claims for special fees for anæsthetists' services. In one county, although 706 fees had been paid for anæsthetists' services, no question had been raised as to range of service. The witness thought that the insurance service compared favourably with pre-insurance contract service; it was more settled and stable, and he hoped to see it extended eventually to the dependents of insured persons.

Sir Thomas Neill said that he wished the Court to be informed of the fact that the questionnaire sent to the insurance committees had not, in fact, been considered or approved by the committees in full session. He did not say that the answers would have been different had the committees been able to consider them, but he wished to make it clear that the representatives of the insured persons had not had the opportunity of considering the replies.

Twenty county and 23 county borough committees had not replied to the questionnaire. When the committees met there would be discussion on the matter, and possibly the Court would have representations made to them at a later stage. Dr. Cox inquired whether Sir Thomas Neill proposed to take the opinion of all members of approved societies before submitting his evidence. In reply to the Chairman, Sir Thomas Neill said he did not wish to ask the witnesses any questions, because in his view the proper evidence was not before the Court, having regard to the fact that the replies had been drafted by the chairman and clerk of the committees, and sometimes by the clerk only, but not by the full committee.

The Chairman suggested that as three-fifths of the insurance committees represented members of approved societies, the chairman should often be a society representative. He was very anxious to consider the matter from every point of view. They would take into account the method by which the answers to the questionnaire had to be prepared, but he could not help feeling that the view expressed by 80 out of 123 committees probably represented the general opinion.

The Medical Service in Scotland and Wales.

Mr. F. Llewellyn Jones, giving evidence on behalf of the Association of Welsh Insurance Committees, said that he was satisfied that there had been an improvement in the medical service under the Insurance Acts. Practically all medical practitioners in Wales were insurance practitioners also. Questions as to range of service were almost unknown. He had found that whenever important questions affecting the medical service had arisen, the medical members of the insurance committee had considered the complaints in a judicial manner. In reply to the Chairman, witness said he had no reason to suppose that those committees who had not answered the questionnaire would have disagreed with the replies before the court, or that the replies of the chairman and clerk did not represent the views of the committee as a whole; in the case of his own committee (Flintshire) the vice-chairman, who was the representative of an approved society, had endorsed the answers. Replies had been received from all the large committees.

Mr. W. M. Marshall gave evidence on behalf of the Scottish Association of Insurance Committees. Thirty-five replies had been received to the questionnaire. Both his executive committee and the committees who had replied agreed that the medical service had been and was a good one, in the main. There were bound to be occasional cases of neglect and of irregular certification, having regard to the numbers of insured persons and doctors concerned, but during the last two and a half years the number had been negligible. There had been only 29 cases of complaints as to treatment, and of these ten were not sustained. He agreed that, on the whole, insured persons were treated as well as private patients. In 11 years no case had been raised in his area (in which there were 220 insurance doctors) as to whether any service was or was not a general practitioner service. Throughout Scotland there had been only two cases of disagreement between the local medical committee and the insurance committee on a question of range of service. The usual county insurance practice was 300 to 500 patients; for boroughs it was 1000 to 2000. The number of services per insured person per annum varied widely. In some country areas it was as low as two; in more populous districts it was as high as four; while the figures of a doctor with a panel of 750 patients in a mining village showed nearly five services. In reply to Sir Thomas Neill, the witness said that many people might hesitate to complain against their doctor, particularly in areas where only one doctor was available.

Dr. Gordon Ward, on behalf of the Medical Practitioners' Union, put in further figures on some of the points which had been raised by the Ministry. An analysis of the advertisements for the sale of practices which had appeared in THE LANCET during 1923 showed an average minimum fee in private practice of 3*s.* 6*d.* The National Deposit Friendly Society operated much on the lines of the national insurance scheme, and the average fee there worked out at 4*s.* to 5*s.* a service. As regards the number of services which a doctor could perform in a day, witness instanced the case of Kent, where the maximum number of services would be 25, because the population was not large enough to allow a greater amount of work being distributed among the doctors practising there. Although advertisements had been mentioned which quoted the size of the panel practice, it must be remembered that in very many advertisements the vendor stated, as an inducement to purchase, that there was no panel.

The Ministry's Case.

Mr. M. L. Gwyer, solicitor to the Ministry, then closed the case for the Ministry. He said that he wished to emphasise the fact that the Ministry had not attempted to fix a capitation fee on the basis of ensuring a whole-time living wage; they did not offer a fee which would insure the medical profession against unemployment or insufficient practice, neither were they concerned with the number of potential patients. Their case was that for the time and trouble which a doctor gives to his insurance patients a capitation of 8*s.* 6*d.* was fully sufficient. What the doctor did outside and beyond his insurance work could not enter into their calculations.

Although the Ministry had suggested a total of 24 services a day for half-time work, it was interesting to note the results obtained from the figures submitted by the Insurance Acts Committee. A net income of £1200 represented a gross income of £1400; the half of this—£700—represented a list of 1650 insured persons at a capitation fee of 8*s.* 6*d.*, and on a 3·5 attendance basis this would mean 19 services daily. If, as was suggested, the present capitation fee was insufficient and failed to attract men to the service, why was it that the number of panel doctors had increased even since the fee had been reduced from 11*s.* to 9*s.* 6*d.*? It might be thought that the Ministry had been too meticulous in their calculations, but the service covered so great a number of insured persons that fractional calculations were of importance; a variation of every shilling in the capitation fee represented £750,000. In conclusion Mr. Gwyer expressed the hope that the Court would indicate in their report for what period the new capitation fee should be applied.

The Chairman inquired whether the Court was able to fix a period binding on both parties, or whether in this respect they could merely make a recommendation.

Mr. Gwyer replied that the parties had agreed to accept the capitation fee for a period of one year; any recommendation for a longer period would, of course, be treated with great respect, but would not be binding.

Dr. Brackenbury agreed, but said that the profession definitely did not approve the principle that an award for a longer period should be at a lower figure.

Dr. Ward expressed the hope that an award for a longer period would not be regarded by the Minister as taking the place of the Royal Commission which had been promised.

Private Contract Rates.

Dr. Cox made a statement on the figures quoted by Mr. Jeffrey for Scottish contract practices. Mr. Jeffrey had tried to show that the fee of 9*s.* 7*d.* for Scottish colliery districts was really only worth 7*s.* 1*d.*, yet in 1919 when the Scottish doctors were negotiating with the miners they had agreed to accept as the general basis the count in a certain mining village, and that count had resulted in the average figure of 5·25 dependents, which gave an equivalent of 9*s.* 7*d.* Mr. Jeffrey had quoted some of the lower capitation rates which existed in contract practice,

yet there were many high rates also. Thus, in Leicestershire 41,000 persons received benefit under a scheme which paid 13*s.* per head for treatment and medicine; the same figure applied to Bournemouth and Southampton. It would be unfortunate and entirely wrong if the doctors were put at a disadvantage as regards insurance practice because they were in certain instances accepting a low rate for dependents. The cases were not parallel. Treatment for dependents did not involve the keeping of the official records or the issue of onerous certificates, and many services carried a special fee. If the doctors, following the tradition of the profession, gave treatment to dependents at a rate lower than the average it would be unfair to penalise them on this account in respect of their other work. He had frequently warned the profession that an attempt would be made to reduce their capitation fee by a reference to some of the rates for contract treatment to dependents.

The Doctors' Case.

Dr. Brackenbury then concluded the case presented on behalf of the doctors. He said that he did not propose to deal in great detail with the comments made by the other side, because in his view there were certain broad principles which would necessarily determine the question. As to the range of service, he was content to accept the statement made on behalf of the Ministry and the evidence of the insurance committees. Every insured person was, however, entitled to the services of a second doctor in an emergency, the payment for that service coming out of the pool provided by the capitation fees. An insured person could also claim the services of a second doctor whenever his own doctor was away, and there was a similar provision when an anæsthetic was required. These facts were material in any comparison made with private practice.

It was said that in spite of a reduction in the capitation fee there had been a sufficient entry into the service. This might be true as regards total numbers, but the average doctor could not avoid undertaking insurance practice, and it was therefore illogical to say that the terms were adequate because the doctors undertook this class of work. At present many doctors starting in practice asked themselves "How can I avoid insurance work?" The Insurance Act would not have attained its object until there was a willing service by the doctors. There might be a sufficiency in the total number of doctors without an adequate distribution. There were industrial areas offering little or no practice outside insurance work. To attract doctors to those areas you must make it worth their while either by a differential capitation fee or by taking those circumstances into account in fixing the uniform capitation fee.

They had been criticised for their comparison of the responsibility of insurance practitioners as between 1913 and 1923, but they considered that if the Court desired to make a comparison between those years the cumulative effect of the additional services required from the doctors should be taken into account. Even in 1913 both the State and the doctors intended insured persons to have a full general practitioner service, but the conception of what that involved had developed in the intervening years.

The Ministry contended that the convergence of the results shown by the Ministry's different methods of calculation proved the correctness of the results; but there was equal convergence of the results obtained on their side. The doctor's case was that the fee of 7*s.* 3*d.* of 1913 or 11*s.* of 1920 should be applied to present-day conditions. It was suggested that both these figures should be abandoned as a basis of calculation, but he did not agree. The arbitrators in 1920 gave no explanation of the method by which they had arrived at their award, and he was at least entitled to assume that (as certain calculations which he had made seemed to suggest) they did accept the 7*s.* 3*d.* basis. It had been said that the 11*s.* rate would have been less had it not been for inflation; but he was equally entitled to say that had the arbitrators known that prices would continue to soar—as they had done—after the date of the award, they would have fixed a higher figure. As to the cost of living figures on which the doctors' case was based, Prof. Bowley's tables for 1920 were generally admitted to be valuable. Prof. Bowley had taken the actual figures for 1913 and had then applied them to 1920 by considering the actual middle-class budget for the latter year; now, in 1923, he applied the same principle by asking what was a reasonable way in which a similar budget would be expended at the present time. It was unfair to write up the 1920 budget for purposes of comparison with 1923 unless the 11*s.* capitation fee of 1920 were also scaled up and adjusted. Even if they considered the amended figures, the new capitation fee would be 10*s.* 4*d.* or 9*s.* 2*d.*, according to whether it was worked out on the 7*s.* 3*d.* or 11*s.* basis.

As to practice expenses, it was true that in some of the paragraphs of their printed case they had taken 16 per cent., but this did not represent their view of a reasonable figure. In previous years they had worked on the 25 per cent. basis and the Ministry had accepted that percentage; his colleagues were very emphatic that even this was too low, certainly as regards small practices and large practices. Mention had been made of cases where the minimum fee of 1*s.* 6*d.* was charged in private practice, but he suggested that such instances should be ruled out; the Insurance Act had been introduced to put an end to that sort of thing. A minimum fee mentioned in an advertisement represented the absolute minimum charged to any of the doctor's patients; it was not necessarily the normal or average figure and might be applicable only to a few patients.

Regarding the time equivalent, they did not quarrel with the instructions which had been issued to regional medical officers in connexion with the examination of the records on which the Ministry's figure of 3·5 services per insured person per year had been based; but they did say that it was almost impossible to carry out those instructions in detail. His committee had collected statistics affecting over 600,000 insured persons, and these showed the correct figure to be 3·77. During the 1920 arbitration the Ministry had themselves adopted the figure of 3·8. It was significant that in Manchester and Salford, where it was to the direct interest of the doctor to keep a careful record of all visits and attendances, the figure was 4·35. He suggested that it was not, in any case, safe to work on the lowest figure which had ever been arrived at and which had been determined with reference to a particular year. The profession were making no extravagant claim in suggesting that the calculations should be made on the basis of 3·8.

As to the number of services which would occupy a doctor's whole time, the calculation of 300 working days of eight hours each, allowing only Sundays free and a fortnight's holiday in the year, was in itself fairly severe. Further, it was wrong to take account only of the time occupied in actually seeing the patients. To that must be added the time for writing the certificates, records, &c. required by the Regulations, and there was also the professional thought, consideration, and reading which the doctor had to give to his work: it might be difficult to translate this into a time equivalent, but it was a very real factor to be taken into account. It had been suggested that 10 consultations might be given in an hour, but in his opinion that could not be done; it might be possible for routine work, but in the midst of the routine work there would arise a special test or other special service which would hold up the doctor for a considerable time; even 5 per cent. of special cases occupying 10 per cent. of extra time—a low estimate—was a factor to be considered. The Ministry's case was based on a high number of working days per year (300), a high number of services per day (48), and a low service rate per insured person per year (3·5). In his opinion that represented an amount of work which could not be done with justice either to the doctor or to the patients. Dr. Smith Whitaker had suggested that if 2000 insured patients would take up more than a doctor's half time, let them assume a fraction of four-sevenths; if they did that the

capitation fee of 8*s.* 6*d.* would at once be raised to 9*s.* 9*d.* The Ministry had said that the 8*s.* 6*d.* capitation fee was equivalent to a service fee of 2*s.* 5*d.*, which, in turn, was worth the equivalent of 3*s.* in private practice. Even accepting the latter figure the fee would be very moderate, but he suggested that if one made an addition to the 2*s.* 5*d.* figure because there was no cost for medicines or collection, and no bad debts, a corresponding reduction should be made for the additional work which had no counterpart in private practice—e.g., certificates, the provision of a second doctor, &c. In conclusion, Dr. Brackenbury expressed the opinion that the profession had been modest rather than extravagant in assessing the value of their services to the State and to their patients.

At the close of Dr. Brackenbury's remarks, the Chairman, amidst general applause, said that the profession were fortunate in having so able an advocate.

The Court adjourned until the 15th to hear the evidence of certain independent approved societies. The main case of the approved societies will be stated on the 21st.

FOOD IN RELATION TO HEALTH AND DISEASE.

FOOD in its relation to health and disease can be considered broadly in two aspects: firstly as a medium by which disease may be spread throughout the population, and secondly, as an economic and dietetic problem, whereby the standard of nutritional value is maintained. It is the duty of the Ministry of Health to supervise the food-supply of the country with these two objects in view—the control of disease and the prevention of adulteration. How this duty has been construed is made clear in the passages from the report of the Chief Medical Officer which are here summarised.[1]

Milk: Production and Distribution.

The importance of milk as an article of diet has long been recognised by those concerned in the investigation of nutritional requirements, but of all foodstuffs milk and its products have been the most blamed for the spread of disease on the one hand and have been most often adulterated on the other. Hence the necessity for the very strict control of all that appertains to the dairy. Since 1885 the sanitary authorities have administered regulations for the maintenance of a clean milk-supply, but even now at least 5 per cent. of the milk coming into London, when sampled at the termini, contains tubercle bacilli. As the importance of milk as a possible source of infection, particularly of tuberculosis, became more and more evident, a scheme of grading the milk according to its purity was introduced in the Milk and Dairies (Amendment) Act of 1922, and the Milk (Special Designations) Order of 1923 sets forth the principal conditions applying to the various classes of milk.[2]

The system of licensing involves the inspection by the Ministry of farms and retail depôts in various parts of the country. Such inspections include a survey of the methods of milk production by means of the score card, the identification of animals in the herds, the methods of handling, bottling, and distribution, and compliance with the regulations for the several grades. The growing interest taken by milk producers, distributors, and consumers in the supply of a milk of special purity is indicated by the steady increase in the number of licences for which application is made, but at present the amount of this high-grade milk supplied is almost negligible. The production of such milk has a substantial educational advantage and proves the practicability of an improved milk-supply for all consumers.

It is important that the general public should realise the advantages of milk as a food, especially for growing children. Hitherto this country has been very backward in this respect, the average consumption per head of milk in Great Britain being less than one-third of that amongst the people of the United States. In fostering such a movement those concerned will do well to give due consideration to the many factors which account for the relatively small consumption of milk in this country. Amongst these not the least important is the unsatisfactory condition as regards cleanliness of a considerable proportion of our milk-supplies. The importance of obtaining a good name for milk in this respect should not be overlooked. The conversion of our population to a satisfactory standard of milk consumption will depend very largely on the energy displayed by all concerned in raising the whole standard of milk production and distribution to a level such as that which has already been reached by milk produced under the grading scheme. What does this involve? First, clean and healthy milch heads; secondly, clean milking; third, effective cooling of the milk immediately it is obtained; lastly, prompt bottling at the farm, or clean and rapid transit in bulk. These appear to be simple requirements, but their fulfilment demands thorough and continuous attention to detail and good organisation. For consumption in industrial towns there is much to be said for the use of pasteurised milk, but pasteurisation cannot make dirty milk clean; to be wholesome and to have keeping properties the milk must itself be clean.

Notwithstanding the numerous difficulties which present themselves in bringing offences home to milk adulterators, local authorities, as a whole, show commendable zeal in endeavouring to maintain its purity in this respect. The returns furnished by public analysts show that in general milk as sold to the consumer is satisfactory as regards milk-fat and other milk solids.

Food Poisoning.

During the past year a considerable number of outbreaks of food poisoning were reported. The origin of these outbreaks was investigated by local officers or by means of inquiries made by medical officers of the Ministry. It would be of assistance if the coroners understood that the bacteriological examinations should be made at the Bristol University by Mr. Bruce White, the material being forwarded by the doctor making the post-mortem; at times in large towns this doctor has practically an appointment and may think he loses dignity if the bacteriological work is not carried out by himself. The causes of food poisoning may be classified as being due to chemical poisoning, to bacterial invasion, or to ingestion of toxins contained in food. Lead, copper, and zinc from vessels employed in the distribution of beer and soda-water were responsible for some cases of chemical poisoning in London and Manchester. A case of zinc poisoning which occurred at Ipswich caused the local authority to issue a warning to the public against the making of jam in galvanised iron vessels. In this case a sample of home-made jam was brought to the local health department as it had been found to have a peculiar flavour. It had been made in a galvanised iron pan. The public analyst found that the jam was contaminated with zinc to a poisonous extent.

A large amount of work has been done in perfecting the electrolytic method of estimating arsenic. An apparatus has been evolved which constitutes a great improvement on previous types, and is likely to be adopted in other laboratories in preference to the zinc and acid method. During the year arsenic was discovered in samples of cocoa, tea, baking powder, and food wrapping papers, but no poisoning resulted in consequence. Arsenic had gained access to the cocoa, though not in deleterious doses, by means of potassium carbonate, contaminated with this substance which had been used in the preparation of cocoa to increase its solubility.

[1] Annual Report of the Chief Medical Officer of Health for the year 1922. H.M. Stat. Office, 1923.
[2] THE LANCET, 1922, ii., 1397.

Bacterial poisoning occurred on a considerable number of occasions in the last 12 months. In some, one person only or one family was attacked and the matter came to notice on account of the holding of an inquest. Other outbreaks, however, were on an extensive scale. The articles of food which came under suspicion as the cause of illness were of the most diverse nature. In many instances an organism of the Salmonella group was isolated. Outbreaks due to cheese are of interest, as in four instances cheese of Canadian origin gave rise to poisoning, on two occasions on a considerable scale; analysis of the cheese failed to reveal food poisoning organisms, but a water-soluble toxin was found to be present. Agglutination tests for the presence of members of the Salmonella group gave negative results, but in a small outbreak of food poisoning due to Wensleydale cheese positive results in this respect were obtained. Tyrotoxicon was not found in any of the cheeses.

Exaggerated Dangers.

The ingestion of toxins contained in food was exemplified by the outbreak of botulism at Loch Maree in August, 1922. The dramatic circumstances of the case directed public attention to possible dangers of poisoning which, though alarming in themselves, are less so when viewed in their relative proportions. A wholesale condemnation of preserved meats through fear of botulism or any other disease is both rationally and economically unsound. Of necessity, canned and prepared foods now enter largely into the dietary of the British public, and form an important and valuable part of the food-supply of the nation. That illness of one sort or another should occasionally result from their use, as it does from other forms of food, is well-nigh inevitable. Having regard, however, to the enormous quantities of canned and prepared foods consumed, the remarkable fact is, not that accidents should occasionally occur from their use, but that these accidents should have been so few and far between. In this connexion, it should be remembered that the outbreak at Loch Maree is the only authenticated instance of the occurrence of botulism in this country. The illness was attributed to the consumption of wild duck paste, prepared and put up in small jars in one of the best equipped and managed factories in London. A very large number of jars were all prepared at the same time and in exactly the same manner, yet only one jar out of a total of many thousands gave rise to botulism, the contents of the others apparently having been consumed without ill-effect of any kind. Alarm in respect of water-supply, milk, and food, may sometimes be justifiable and salutary, but unless the circumstances are quite exceptional such alarm may prove to be extremely damaging both to the national health and to national industry. Flour, cheese, milk, tea, coffee, cocoa, meat, and prepared foods form staple and universal articles of dietary, and sporadic or accidental contamination here and there should not so disturb the public mind as to lead to widespread condemnation or discarding of these foods. An accident, tragic and regrettable in itself, affecting a single household or a dozen persons may in these days of ready intercommunication be so widely announced and amplified as to lead to the deprivation of millions of people of their usual food and to irreparable damage to great industries, resulting in extensive unemployment and serious financial loss.

The immediate result of this outbreak was an investigation of the methods employed by a certain great food manufacturing firm in securing sterilisation of their products. These were found to be eminently satisfactory, and are all embodied in the steps which Sir George Newman details in his report for the protection of the consumer. The measures adopted are stringent and the habitual practice of them involves a thorough, sound, and comprehensive health administration of a factory. But experience shows that such an administration is practicable and business-like. If the custom and confidence of the consumer are to be secured and retained, such an administration, a sort of "industrial health conscience," is necessary. To be efficacious, and free from hazard and chance, such a health administration must be a partnership between four parties—(1) the manufacturer, (2) the central health authority, (3) the local sanitary authority, and (4) the public, as consumer. The consumer has his own responsibility in the domestic preparation or purchase of food. He is represented by public opinion and by the press. Both are of the utmost value in affording information, providing education, and raising the standard of the food-supply, and, as a corollary, the health and efficiency of the nation.

WORK OF THE FOOD INVESTIGATION BOARD.

In this department of the Committee of Scientific and Industrial Research the outstanding event[1] of the year is the equipment of the Low Temperature Research Station at Cambridge up to the point at which work could be begun. The research staff took charge and began work in June, 1922; the equipment of the station is not yet complete, but the first floor, devoted to fruit and vegetable work, was ready for the apple harvest, and the freezing tanks were ready in October, when the first lot of fish were frozen in them. Four chambers at the station have already been fitted with automatically controlled electrical heating; the designing and testing of this equipment has taken much time, but it has been found possible to maintain temperatures in these rooms over long periods with no greater fluctuation than 0·05 of a degree—an accuracy hitherto only obtained on a small scale by the employment of incubators. The facilities now provided will enable experiments involving bulky apparatus to be carried out.

The station was intended to fulfil two allied purposes—first, to act as an instrument for research carried out by the various committees of the Board, and incidentally to offer to workers in other laboratories of the University its own peculiar facilities for research in which low temperatures are required. Thirty-five such research workers at one time or another made use of it.

During the year under review a new development of the Board's activities took place, along lines laid down in 1918, of an intensive study of the physiology of the ripening process of a single fruit under normal and storage conditions. The apple was selected for this purpose, and when this investigation is completed other fruit will be studied in a similar fashion. The Board was asked to organise a small expedition to investigate, during an entire voyage from Australia, the gases in ships' holds in which apples were carried, and especially to compare the different methods in use for cooling the holds. The expedition left early in the year.

A brief abstract is given of the work of the Fish Preservation, Meat Preservation, Engineering, Fruit and Vegetables, Oils and Fats, and Canned Food Committees. The general theory of the freezing of tissues promises to be substantially advanced by the discovery made in connexion with experiments upon eggs that preservation does not depend upon a critical rate of cooling being exceeded, but upon the rate of cooling falling within certain limits. When these are observed, the changes which take place on freezing are reversed in thawing; when they are exceeded, the changes are irreversible.

[1] From the report of the Committee of the Privy Council for Scientific and Industrial Research for the year 1922–23.

SMALL-POX IN ENGLAND AND WALES.—The number of cases of small-pox notified in England and Wales during the week ended Jan. 5th had risen to 115, distributed as follows: Derbyshire 39 (Bolsover 2, Chesterfield 20, Heanor 4, Swadlincote 7, Blackwell R.D. 4, Chesterfield R.D. 1, Shardlow R.D. 1); Gloucestershire 26 (Gloucester 3, East Dean R.D. 23); Leicestershire 14 (Ashby Woulds); Northumberland 2 (Bedlingtonshire); Notts 34 (Hucknall 21, Kirkby-in-Ashfield 12, Basford R.D. 1).

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Provision for the Treatment of Ophthalmia Neonatorum.

THE Scottish Board of Health has issued a circular to the local authorities emphasising the fact that ophthalmia neonatorum is a preventable disease, and that even where it occurs its disabling effects can be avoided by prompt and adequate measures of treatment. Advance has recently been made on these lines, but cases still occur in spite of the efforts of medical practitioners, midwives, and public health authorities. As a source of blindness, ophthalmia neonatorum is of first importance, and blindness, apart from the disaster to the individual, involves a very serious charge upon the community in the maintenance and education of totally or partially blind persons. The Board are impressed with the necessity that every local authority administering a scheme of maternity service and child welfare should make adequate provision for the hospital treatment of this disease, for in their opinion few, if any, cases can be treated at home with any degree of safety. Ordinary nursing is not sufficient; treatment must be carried out by a specially trained staff, therefore the Board requests all local authorities to make definite arrangements with a suitable hospital where such skilled treatment may be obtained, for accommodation cannot be satisfactorily improvised on the occurrence of a case. It is also desirable that accommodation be provided for the mother to accompany the child wherever it can be arranged. This provision is all the more necessary, as the possibility of secondary infections is recognised as an important factor in the continued incidence of the disease, and special precautionary measures are required where there is any reason to suspect a risk of infection from the mother. While it is essential that no delay should arise in providing treatment for any case, the Board realises that the cost and inconvenience of maintaining suitable accommodation in the smaller infectious diseases hospitals would be burdensome, as in most areas the annual case incidence is not large. To avoid this difficulty local authorities outside the larger centres of population are advised to make arrangements with some institution already providing the necessary skilled attendance. The net cost of such treatment is a competent charge on the child welfare grant.

With regard to cases in which the necessity for removal to hospital is not immediately apparent, it is the duty of the local authority to provide adequate skilled nursing at home, the cost of this provision being also a competent charge on the child welfare grant. In such cases the medical officer of health should, through the health visitors or visiting nurses, ascertain progress from day to day, in order that hospital treatment may be at once commenced if the disease shows any tendency to become more serious. As the total number of cases for Scotland is small, the expense of making suitable arrangements will not be heavy; indeed, compared with the cost of education and maintenance of persons blinded by neglected disease it will be negligible.

Measles in Glasgow.

A meeting of representatives of local authorities and medical officers of health from the larger areas in Scotland specially interested in the prevention and control of measles during epidemic periods was held on Jan. 10th in the offices of the Scottish Board of Health, Edinburgh. The meeting was convened by the Board with special reference to the recent epidemic of measles in Glasgow and contiguous areas and to the continued high proportion of deaths from the disease that occurs in children under school age. Captain W. E. Elliot, Parliamentary Under Secretary for Health for Scotland, presided. The present position and further measures possible for improved control and treatment of the disease, both in rural and urban areas, were discussed in their medical and financial aspects. Captain Elliot intimated a special limited grant from the Treasury to be administered by the Board in conjunction with the present grant in aid of maternity service and child welfare schemes in Scotland. There was a full expression of opinion as to the general lines on which the grant might best be utilised, and the Board will issue shortly a circular letter to local authorities on the subject.

Appointment of Medical Officer of Health for Aberdeen.

On Jan. 7th Dr. John Parlane Kinloch was unanimously appointed medical officer of health for Aberdeen in succession to Prof. Matthew Hay, who recently resigned the post. Dr. Kinloch was educated at Glasgow High School and University, where he graduated M.B., Ch.B. in 1909. Four years later he obtained the degree of Doctor of Medicine with commendation, and the Diploma of Public Health of Cambridge with distinction. While working in the medical health department of Glasgow before the war from 1909–10 in Ruchill Hospital, Dr. Kinloch had every opportunity of studying the problems of public health in its many varied branches. In addition he acted as instructor in public health to students and nurses in Ruchill Hospital. In 1914 Dr. Kinloch was appointed to a lectureship in public health at Aberdeen University and in the following year deputy medical officer of health for Aberdeen. During the war he was attached for a time to the 22nd Mobile Field Laboratory in France. Dr. Kinloch is the author of many publications on public health subjects, and his services ought to prove a distinct acquisition to the public health department and city of Aberdeen.

University of Glasgow.

At a meeting of the University Court on Jan. 10th Principal Sir Donald MacAlister received the congratulations of that body and of the Corporation of Glasgow on his baronetcy. Arrangements were made to coöperate with the Royal Society on the occasion of the Kelvin anniversary on June 25th, 1924.

A further appeal for the preservation of the Lister Ward has been received by the managers of the Glasgow Royal Infirmary. It comes from Ottawa, and bears the signatures of officials of the Canadian Ministry of Health.

HOLLAND.

(FROM OUR OWN CORRESPONDENT.)

Outlook for the Medical Student.

DURING the past year in Holland there occurred an "epidemic" of good health, which coincided with slack times in the business world, and while any improvement in the national health is an encouragement to those who make it their care, nevertheless the combination of these two factors had hardly a favourable effect on the economic position of the medical profession. The amount of work done by doctors amounted on an average to no more than 60–70 per cent. of a normal year, and the income of the non-panel practitioners decreased in proportion. This is not so very bad for old and established practices, but for the young doctors, of whom the supply at present exceeds the demand, these conditions make life rather hard. The more so as the demand for doctors from the Dutch colonies has ceased and as the Government seems inclined to reduce the already small number of Government posts, which in themselves are none too lucrative. Among others, Prof. van der Hoeve, in the *Geneeskundige Gids*, is asking whether it would not be advisable to restrict in some measure the coming generation of medical students. Indeed, something can be said in favour of such limitation, provided a careful selection is made, not from those merely who can afford high training fees, the economically strong, but from those whose moral character, social attainments, and scientific proclivities mark them among their fellows. Such a selection, however, is exceedingly difficult.

It is almost impossible to form a right and just opinion regarding the moral and social qualities of the young medical students, and further, in general practice, the "scientific man" is, as a rule, not a great success. This limiting system is contrary to the Dutch national character; the only thing will be to inform the coming generation now at school about the practical problems and the economic conditions awaiting them. The public at large must disabuse itself of the old idea that doctors are rich men or earn a living easily. Only thus can the true interests of the medical profession be advanced.

Organisation of the Anti-Tuberculosis Campaign.

Up till the last few years the Dutch Government did not concern itself greatly with the fight against tuberculosis. The campaign lay entirely in private hands and was financed to a considerable extent by private contributions and charity. There were no "consultatie-bureaux" (dispensaries). The organisation was fairly primitive and was conducted in a more or less haphazard way. Small local unions paid their visiting nurses, who at the same time acted as district nurses and distributed various treatment appliances as, for example, Dettweiler sputum-flasks. There were no tuberculosis hospitals, and in most cases sanatorium treatment was too expensive for the man of moderate means, nor did the local unions have the funds to provide such treatment on a large scale. Well-to-do tuberculous patients went to Switzerland. Under these conditions the comparatively small number of sanatorium beds were taken up by serious cases in whom hope of recovery was small, a fact which did not increase the popularity of these institutions. The local unions were grouped into provincial unions and the latter formed one central organisation. In the last few years, however, a combination of circumstances has produced a rapid evolution. The reorganisation of the Government inspectors of public health, which resulted in a special investigation into the tuberculosis question, did much to help in this advance. Of still greater importance was the passing of the Disablement Act, which, in virtue of a certain clause, opens the possibility of preventive and prophylactic treatment through the insurance institutions; under this clause a large number of tuberculous patients applied for treatment. Moreover, the investigation committee succeeded in persuading the Government of the necessity of earmarking certain available sums for the treatment of indigent patients, and impressed the authorities with the necessity of efficient organisation in the anti-tuberculosis campaign.

The Dispensary System.

The plan advocated by the committee, and which will now be put into effect, embodies a separate and autonomic organisation of the campaign with the aid of dispensaries. In every district, in every province, and in some of the biggest towns, a district dispensary will be established under the supervision of a medical man, who need not necessarily be a lung specialist, but who must have business ability, as on this score previous undertakings had completely failed. Under him is a district visiting nurse who trains and controls the local visiting nurses. The medical man keeps in touch with the inspection and the provincial union, whereas, practically speaking, the central organisation has been eliminated. The district dispensaries are the nucleus of social and hygienic propaganda and at the same time form a confirmatory court for the family doctors in the diagnosis of tuberculosis. The bureau does not carry out treatment. This scheme is proving a success, also the insurance institutions are sending tuberculous patients to the dispensaries for examination before admission to the sanatoriums. Thus these dispensaries act as "transition" houses for the sanatorium patients, and further they concern themselves with the "after care" of discharged patients. The type of case now accepted by the sanatoriums for treatment is preferably that in which the patient has a good prognosis and a fairly mild infection, such as are likely to benefit greatly by a course of six months' care and hygienic education.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Battle of the Clubs.

THE ordinances concerning changes in medical attendance on club members have caused great indignation among the medical profession, as I stated in my letter of Dec. 15th, 1923. Interviews with the Government resulted in the withdrawal of certain clauses, especially those dealing with the erasure of a medical man from the panel during his time of contract if it was alleged that he had acted to the detriment of the club. The concessions of the Government were, however, held insufficient by the profession because the provisions limiting the further admittance of medical men to the panel were not amended. The strike for which preparations had been made ever since the new ordinances were published (and which probably might have been avoided if the concessions had been made earlier and on a more liberal scale), was therefore declared on Dec. 1st by the German Medical Union, the so-called Leipziger Verband. The strike became effective nearly everywhere throughout Germany except in the occupied territory, owing to political and social reasons, and in certain districts of Southern Germany, where the clubs had made common cause with the medical profession. The Leipziger Verband gave notice to the clubs that the contracts had been dissolved under German law owing to a vital change in an essential clause, and the clubs did not challenge the notice. The strike, which is still going on, is not a strike in the strict sense of the word, medical attendance being given individually when required, the club members being treated as private patients—i.e., they have to pay the fee for the consultation or the visit direct to the medical man: the prescriptions for medicine are written not as hitherto on vouchers of the club but on a private prescription form; consequently, the patients have to pay the chemist for their medicine. They can, however, recover the money paid to the chemist and the doctor in every individual case at the club offices, a lengthy and troublesome proceeding. During the struggle both doctors and clubs addressed the members through the press by pamphlets and even by posters, each party accusing the other of provoking the strike for futile reasons. The clubs expressed the opinion that the doctors, to put an end to the clubs, were deliberately endeavouring to destroy the shaky financial situation of the clubs, so that they would cease to exist; the medical men complained that the clubs were willing to make use of the ordinances to get rid of the free-choice system, which had lately been introduced almost everywhere after a long struggle. Mass meetings of club members have also been called in Berlin by the Medical Union, where medical men made use of their ability as debaters inviting the members to assist the medical profession in its struggle against the committees of the clubs. The doctors pointed out that the free-choice system the only system assuring careful attendance to club members, could probably be abolished under the ordinances. Under the system of appointed medical officers members were attended in a cursory manner and did not receive adequate treatment, notwithstanding the heavy contributions exacted. It is noteworthy that at the meetings held in Berlin a vote was unanimously passed supporting the demands of the medical men. Up to the present the "strike" (to use this word which is officially rejected by the medical profession) has been successful, only a few medical men having approached the clubs; their names were, of course, published in the medical press and every professional relation broken between them and their professional brethren. The Arbeits-Ministerium (Ministry of Labour) has tried to arbitrate between the parties, but without success, the only result being that the mutual accusations in the press and in pamphlets were stopped.

Plethora of Medical Journals.

Prof. Unger, one of the surgeons of the Virchow Hospital, draws attention to the fact that in spite of reduced incomes in the profession, which do not allow many of its members to subscribe to medical journals, the number of medical periodicals, though decreasing, is still much too large. Speaking of his own specialty, he mentions that two surgical "Centralblätter" are published in Germany in which every article and every work on surgery is reviewed twice by different writers. Concerning medicine in general, no less than four great medical journals are issued, the *Klinische Wochenschrift*, the *Deutsche Medizinische Wochenschrift*, the *Medizinische Klinik* in Berlin, and the *Münchener Medizinische Wochenschrift* in Munich, and in addition to those national journals there exist many local medical periodicals. He suggests that the publishers should reduce the number by amalgamation. If the publishers will not agree to this, he proposes that the surgeons should henceforth combine in subscribing to only one particular Centralblatt in order to compel the other to amalgamate or to disappear. He also urges the medical profession to act in the same way with the weekly medical papers. According to Prof. Unger, it would be no great loss if some of the articles now appearing in the medical press had never been printed at all, while in the remainder efficient cutting down would save much space.

Underfeeding Amongst School Children.

The Berlin Municipal School Board has lately made an inquiry in 12 of the municipal schools as to the present condition of the children. The results of the inquiry showed a rather sad state of matters: 16·5 per cent. of the children had come to school without having had coffee or warm soup in the morning, 38 per cent. had had no bread for breakfast, 6·38 per cent. had brought no lunch sandwiches to school, 5·06 per cent. had had no warm meal the day before, and 31·2 per cent. had only one warm meal in the day. In 15 per cent. footgear was very defective, and in 16·34 per cent. the clothes were inadequate.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. R. R. Horley is placed on the retd. list with rank of Surg. Capt.

ROYAL ARMY MEDICAL CORPS.

Col. S. F. St. D. Green, late R.A.M.C., to be Maj.-Gen., to complete estabt.

Col. A. J. Poole, on ceasing to be empld., is placed on half pay.

The undermentioned Cols., late R.A.M.C., retire on retd. pay: P. Evans, G. St. C. Thom, E. T. F. Birrell, and E. W. Bliss.

Col. C. W. Profeit, late R.A.M.C., is placed on half pay.

The undermentioned Lt.-Cols., from R.A.M.C., to be Cols.: J. W. H. Heughton, G. M. Goldsmith, R. H. Lloyd, Bt. Col. J. M. Sloan, H. D. Packer, and J. W. Leake.

Majs. to be Lt.-Cols.: Bt. Lt.-Col. A. W. Sampey, H. Rogers, S. M. Adye-Curran, L. Cotterill, W. J. S. Harvey, and Bt. Lt.-Col. B. A. Craig.

Temp. Capt. E. A. Tozer relinquishes his commn. and retains the rank of Capt.

Capt. F. J. Hallinan to be Actg. Maj. whilst empld. as Dept. Asst. Dir. of Pathology.

RESERVE OF OFFICERS.

Maj. and Bt. Lt.-Col. C. G. Spencer, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

ROYAL AIR FORCE.

Flying Officer F. K. Wilson ceases to be seconded to the Bristol Infirmary.

INDIAN MEDICAL SERVICE.

Lt.-Col. J. A. Black to be Col.

Puranganal Abraham Mathew to be temp. Lt.

Obituary.

GEORGE ALEXANDER HEATON BARTON, M.D. BRUX.

IT is with deep regret that we announce the death of Dr. G. A. H. Barton, anæsthetist to the Royal National Orthopædic Hospital and to the Hampstead General Hospital, who met with a fatal accident when on horseback in Hyde Park on Sunday, Jan. 13th. Dr. Barton, who was 56 years of age, was an old student of St. Mary's Hospital, where he qualified L.S.A. in 1886 and M.R.C.S. Eng. two years later. In 1901 he graduated M.D. of Brussels University. From the first he specialised in anæsthetics, on which he became a recognised authority, his writings including "A Guide to the Administration of Ethyl Chloride" and "Backwaters of Lethe," which first appeared in 1920. Various articles in medical journals dealt with methods and technique of administration.

A colleague writes: "Dr. Barton was not a man of one side only, but it is only on that aspect of him which appeared in his activities as an anæsthetist that I am qualified to speak. Even so, one was able as a colleague to recognise that Barton was no ordinary man. In his work he showed ingenuity, observation, and perseverance. Further, he made it obvious that he possessed a considerable sense of humour, that he had understanding of human nature, and that he was by no means insensible to the literary and artistic sides of life. These qualities appeared also in his contributions to the literature of his own subject. It is of the first importance for an anæsthetist, more so perhaps than any other medical man, to have the faculty of rapid insight into the mentality of the individual with whom he is dealing as a patient, of accommodating himself to that individual's character, and entering into sympathetic control of him. Barton was well qualified to meet the subjects of his administration in this manner, and his success with them depended as largely on this power as it did on the actual skill of his work. The rather elaborate sequence of anæsthetics which he affected was employed by him with much tact and skill and gave in his hands excellent results. Barton had a sly humour which was not easily apparent to those who were not intimate with him, but which will be sorely missed by his friends. He was a man who formed his own opinion on professional questions and did not merely re-echo those of other men. As a speaker, at the old Society of Anæsthetists and later at the Section of Anæsthetics of the Royal Society of Medicine, which bodies he frequently attended, he was always logical as well as tireless. His sudden death is a great loss to his former colleagues as well as to the many patients who appreciated the value of his professional services and of his personal character."

HENRY ARTHUR LATIMER, M.D. DURH.

Dr. H. A. Latimer, a well-known local figure in medical and civic public life, died on Jan. 10th at his residence in Tunbridge Wells, aged 74. Dr. Latimer was the son of the late Mr. Isaac Latimer, J.P., former Mayor of Plymouth. He received his medical education at Guy's Hospital, obtaining the qualifications of L.S.A. and M.R.C.S. Eng. in 1871, later graduating as M.D. at the University of Durham. For 41 years he conducted a successful practice in Swansea, and played an important part in public medical affairs. He was for 13 years a Direct Representative on the General Medical Council, retiring along with Dr. H. W. L. Browne at the end of 1919, and he often presided at the meetings of the South Wales and Monmouth Branch of the British Medical Association. He held appointments as consulting surgeon to the Swansea Hospital and as medical officer of the local provident dispensary.

Dr. Latimer also took a great interest in the civic welfare of Swansea where he was a member of the town council, a justice of the peace, and a member of the old school board.

In 1912 Dr. Latimer retired from practice and took up his residence in Tunbridge Wells, when he soon showed his keen interest in municipal affairs. He was elected to the town council in 1914, becoming Mayor in 1919–20, and deputy Mayor in 1920–21. During his seven years on the council he took an active and prominent part in the work of many committees, while for a time he was a member of the District Education Board. During the war he was chairman of the local Medical War Committee, and in 1918 was employed by the Ministry of National Service as a member of a Travelling Medical Board for the purpose of examining medical men for the army. As chairman of the Surgical Aid Society, and as one of the lecturers and examiners of the St. John Ambulance Brigade his services were greatly appreciated. He also served on the committees of the Natural History and Philosophical Society and the Rescue and Preventive Society.

One of the officers of the British Medical Association writes of him: "During the past ten years I have only occasionally met Dr. Latimer, whose loss his old friends deeply deplore, but between 1903 and 1913 I saw a great deal of him, constantly worked with him, and developed a great respect and affection for him. He had a very attractive personality and was an excellent speaker. He was one of the men who held strongly by Bacon's saying that 'Every man is a debtor to his profession,' a saying which he often quoted and certainly did his best to exemplify in his life. He gave up not only his leisure but much of the time he might well have been spending profitably in his practice in the service of his fellows, and it is due to his colleagues at Swansea to say that they were always grateful to him for it. Latimer was an excellent example of the good general practitioner who believed that he had a duty not only to his patients but to his fellow practitioners, and practised what he believed."

Dr. Latimer was a man of wide culture and reading, and a polished speaker. His contributions to medical literature were few and weighty: among them a study in our own columns of fibroid phthisis in copper workers. He is survived by his widow, his only son having been killed in the war.

THE LATE SIR JOHN TWEEDY.

IN an obituary notice of the late Sir John Tweedy which appeared in THE LANCET last week, while mentioning fully his various public activities, we gave few details of his clinical work. We now supplement our notice with an account of his ophthalmological work which has been sent to us by one of his pupils and colleagues.

"Probably Tweedy's most valuable contribution to ophthalmology was his demonstration that immature cataracts might be safely extracted. Such cataracts were left severely alone, as experience showed that post-operative inflammation almost invariably followed attempts at their removal. The procedure he adopted was to open the capsule at its periphery and not on its anterior face, thereby preventing the lens matter, which of necessity was left behind, from irritating the iris. He practised this method for many years, until with the advance of knowledge the correct explanation of the cause of post-operative inflammation rendered it unnecessary; but the important point is that he demonstrated the feasibility of removing immature cataracts, and his example was quickly followed with the result that the period of incapacity in such cases has been enormously diminished. Another important contribution was that, instead of adopting uniform treatment for all cases of hard eyeball, he pointed out the importance of ascertaining the precise physical condition causing the increased tension in such cases, and having found it, he removed it if possible. Thus, in those difficult cases of cyclitis with increased tension, he advised repeated paracenteses of the anterior chamber, using an extra broad needle for the purpose.

"He was one of the first, if not the first, of the Moorfield surgeons to protest against indiscriminate tenotomy in cases of internal strabismus, pointing out that the rational procedure was by correction of the hypermetropia combined with orthoptic treatment; he rarely or never did a simple tenotomy. But, on the other hand, he described in THE LANCET March 22nd, 1884, a method of advancement which became the usual operation practised at the hospital. The cosmetic results of the operation in his hands, in cases of secondary divergence, were extraordinarily good, although he employed no fancy method of suturing the tendon. Conical cornea was another subject which interested him, and he thought the explanation of the condition was to be sought in some error of development. He treated the condition by cauterising the apex of the cone, and was very insistent on the necessity of making a complete perforation of the cornea. Tweedy's name occurs in most text-books of to-day as advocating the value of quinine lotion in the treatment of diphtheritic conjunctivitis. This was suggested many years before the discovery of the bacillus of diphtheria. He held the view which was not the accepted one at the time, that the diphtheritic process was a local infection, and with the removal of the latter, the general symptoms would disappear. The effect of the fifth nerve on the nutrition of the cornea was a subject which also interested him much. In addition to the obvious connexion of ophthalmic herpes with corneal lesions, he explained similar lesions of the cornea, unaccompanied by skin eruptions, as probably being due to changes in the ophthalmic nerve or Gasserian ganglion, such changes being in his opinion irritative and not paralytic. These ideas were formed long before the removal of the Gasserian ganglion directed attention to the subject."

In THE LANCET in 1888 (see THE LANCET, 1888, vol. i., p. 966) Tweedy wrote on the extraction of immature cataract and gave a full description of the first case where he performed the operation some eight years previously and with perfect success, since which operation, he said, "I have rarely refused to extract a cataract, no matter how immature, whenever both eyes were so affected that the patient was unable to earn his livelihood; and I have operated on such cases almost as often as they presented themselves." This pioneer patient was a compositor, and a few weeks after a prompt recovery was reading "brilliant" type fluently with suitable glasses.

Any notes of Tweedy's ophthalmic work would be incomplete without a reference to his robust faith in the value of internal medication. His therapeutic were not empirical, or at any rate he could always give a reason why he was using a drug in a particular case. Perhaps the greatest tribute of all to Tweedy's work as an ophthalmologist is to be found in the wide view he took of the subject, the result of his philosophic and well-stored mind.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

PARLIAMENT was opened by the King in person on Tuesday last. Contrary to expectation the speech from the Throne contained no reference to health insurance proposals. The main features, so far as home politics are concerned, were that the local authorities were being approached with a view to increased activity under those sections of the Housing Act which enable the working population to become the owners of their houses, and that further measures would be taken to relieve unemployment. H.M. Ministers regretted that the country had not accepted the recent proposals laid before them. Bills would be introduced to improve the position of pre-war pensioners, to amend and consolidate the Factory and Workshop Acts, and to ascertain the costs and profits in connexion with the distribution of milk.

Correspondence.

"Audi alteram partem."

CENTENARY OF THE LANCET.

To the Editor of THE LANCET.

SIR,—The Council of the Royal Society of Medicine desires to take the opportunity—its first meeting since your Centenary—of offering its most cordial congratulations to the Editor and proprietors of THE LANCET on the occasion of its Centenary.

The Council feel that, representing a medical society which celebrated its own centenary in 1905, there is a special appropriateness in congratulating those responsible for the carrying on of their brilliant contemporary. The Society has subscribed to THE LANCET from its first number, and during the hundred years which have passed there has been no addition to its library that has been so eagerly looked forward to and read, and it is not too much to say that its pages have always proved a constant encouragement and support to the advance of medicine in its broadest and best aspects. The Council is delighted to see that under its present management THE LANCET has begun its second century with every prospect of carrying on, so that a hundred years hence their successors may be congratulated on having proved themselves worthy in every respect of their founder and their predecessors.

Yours very truly,

W. HALE-WHITE,
1, Wimpole-street, W., Jan. 8th, 1924. President.

THE AURICULAR BEAT.

To the Editor of THE LANCET.

SIR,—I have read the article by Dr. A. J. S. Pinchin and Dr. S. R. Gloyne in your issue of Jan. 12th with much interest, but I do not understand what is meant when they state "At the apex of the heart the auricular beats . . . could be heard as loud regular *beats* . . ." (the italics are mine). The first sound of the heart has been assumed to be due to the contraction of the ventricular muscle as well as to the closing of the mitral valves, but of late it has been recognised that muscular contraction produces no sound. Does the closing of these valves, if they produce a sound, give rise to the ventricular or auricular "beat"? At the post-mortem examination there was found 5 ounces of fluid in the pericardium, and the movements of this increased quantity are, I venture to think, sufficient to account for any added sounds. It is not recorded whether there was any negative pressure intra-pericardially. In such cases the negative pressure has generally disappeared and the fluid movements are consequently less restrained and give rise to more sounds.

I am, Sir, yours faithfully,

Swansea, Jan. 15th, 1924. G. ARBOUR STEPHENS.

PROF. WHARTON JONES AND THE LATE SIR JOHN TWEEDY.

To the Editor of THE LANCET.

SIR,—I consulted Sir John Tweedy for the first time in 1883 or thereabouts, and on that and another occasion had to be insistent before I could prevail upon him to accept a fee. I should like to add to the names of the eminent staff of University College Hospital at the time when he became a medical student the name of Thomas Wharton Jones, who was held in affectionate esteem by Sir John Tweedy, as well as by the famous Professor Huxley, who had been his pupil and who is reported to have said of him with emphasis "He taught me everything." It is on record that Wharton Jones described Sir John Tweedy as "my best ophthalmic pupil," while Sir John Tweedy, in the obituary notice of his late master, written for THE LANCET, gave full expression to an intention to keep green the memory of a life-long and devoted student of science.

I am, Sir, yours faithfully,

Eastbourne, Jan. 14th, 1924. P. G. CAWLEY.

MEMORIAL TO THE LATE DR. WALLACE BEATTY.

To the Editor of THE LANCET.

SIR,—Past students and friends of the late Dr. Wallace Beatty may be interested to learn that a memorial fund has been opened at the Adelaide Hospital, Dublin, to perpetuate his memory. The hon. treasurer of the committee is Mr. W. Hogg, Fintragh, Shrewsbury-road, Dublin, by whom subscriptions will be gladly received.

I am, Sir, yours faithfully,

Dublin, Jan. 13th, 1924. W. G. HARVEY.

LIVERPOOL MEDICAL INSTITUTION.

To the Editor of THE LANCET.

SIR,—In your report of a paper read by me before this Institution on Dec. 20th, I am stated to have referred to the use of Hewitt's airway. This is not so. The airway I use is that designed by Mr. Blair Bell of Liverpool, a woodcut of which appeared in his text-book on gynæcology many years ago; this particular airway is shown in Dr. Silk's handbook on modern anæsthetics erroneously as Hewitt's. Mr. Blair Bell's latest modification is, I think, an improvement; it is made of copper, the metal tube being divided into five channels so that the respired air is in consequence kept at a higher temperature after the manner of the turbinate bones.

I am, Sir, yours faithfully,

Liverpool, Jan. 11th, 1924. H. H. L. PATCH.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council held on Jan. 10th, Sir John Bland-Sutton, the President, in the chair, the undermentioned diplomas were conferred (in conjunction with the Royal College of Physicians of London) upon the following candidates:—

DIPLOMA IN PUBLIC HEALTH.

E. Benjamin, Bombay and King's Coll.; Florence Bentham, St. Mary's and King's Coll.; M. L. Bery, Manchester; F. J. Darbyshire, Westminster and Royal Inst. Public Health; May C. Ferguson, Dublin and Royal Inst. Public Health; J. M. Ghosh, Calcutta and Univ. Coll.; M. R. Goverdhan, Bombay and Royal Inst. Public Health; Eleanor Harse, Royal Free and Univ. Coll.; E. C. Holtom, Haslar and Univ. Coll.; I. Lewis, Univ. Coll.; R. C. Lightwood, King's Coll.; W. S. McGillivray, Aberdeen and Univ. Coll.; R. H. Parry, Middlesex; H. C. G. Pedler, Univ. Coll.; M. K. G. Pillai, London and Royal Inst. Public Health; Ruth W. Plimsoll, St. Mary's and Univ. Coll.; J. Reid, Cork and Royal Inst. Public Health; P. M. Rivaz, Durham and Royal Inst. Public Health; C. Ross, Glasgow; Effie F. A. Samter, Manchester and Univ. Coll.; N. S. Sethi, Punjab and Univ. Coll.; R. W. G. Stewart, Belfast and Naval Med. Sch., Greenwich; M. L. Sutcliffe, Univ. Coll.; I. S. Thomson, Aberdeen and Royal Inst. Public Health; J. R. Tibbles, Aberdeen and Univ. Coll.; J. Whitby, Middlesex and Royal Inst. Public Health; and S. A. Withers, Univ. Coll.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.

Y. A. N. Barrada, P. N. Basu, M. G. Bhandari, H. Das, W. K. Dunscombe, A. A. Hearne, H. B. Lee, G. R. McRobert, P. S. Mills, W. L. Paterson, P. S. Slewyn-Clarke, T. S. Tirumurti, H. S. Watters, C. L. Wilmoth, and A. D. Wright. (All these candidates studied at the London School of Tropical Medicine.)

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

D. R. Alexander, F. G. L. Barnes, J. D. Dyson, A. F. Grimbly, H. D. Hayes, W. J. Lascelles, D. B. M. Lothian, E. E. Pittman, and J. Roy.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.

J. B. Horgan and W. Wilson.

UNIVERSITY OF LONDON.—A course of three lectures on the Treatment of Contracted Pelvis will be given at the London (R.F.H.) School of Medicine for Women (Hunter-street, Brunswick-square, W.C.) by Dr. Gibbon Fitzgibbon, on Jan. 29th, 30th, and 31st. At the first lecture the chair will be taken by Dr. J. S. Fairbairn. A course of four lectures on Respiratory Exchanges will be given by Prof. Winifred Cullis at the same place on Jan. 24th and 31st, Feb. 7th and 14th, at 5 P.M. Attendance at this course is recognised in connexion with the B.Sc. (Honours) Degree in Physiology. Admission to all these lectures is free.

A NEW edition of Prof. Hugh MacLean's "Modern Methods in the Diagnosis and Treatment of Glycosuria and Diabetes" (Constable and Co.) is announced for early publication.

MANCHESTER CLINICAL SOCIETY.—A lecture will be given in the Medical School, University of Manchester, on Thursday, Jan. 24th, at 4.30 P.M., by Sir Thomas Horder, entitled Medicine and Old Ethics.

A MEMOIR of William and John Hunter, by George C. Peachey, to be published in February, will contain six portraits and a sketch of the early teaching of anatomy in England to 1746, and will throw new light upon William Hunter's association with the Society of Navy Surgeons and upon John Hunter's army career.

TUBERCULOSIS SOCIETY.—A meeting of this society will be held to-day, Friday, Jan. 18th, at the Margaret-street Hospital, Margaret-street, London, W. 1, at 8 P.M., when Dr. A. S. MacNalty will read a paper on Tuberculosis Work in England. After the paper the London County Council Scheme for Post-graduate Study for London Tuberculosis Officers will be discussed.

ROYAL SANITARY INSTITUTE.—An introductory lecture to this term's courses of lectures and demonstrations will be delivered by Dr. Charles Porter on Jan. 28th at 5.30 P.M. (admission free). The course for sanitary officers will be delivered on the 29th, that for meat and food inspectors on Feb. 8th, and the course for health visitors and child welfare workers on Feb. 4th. Further information can be obtained from the Director and Secretary, Mr. E. White Wallis, at the offices of the Institute, 90, Buckingham Palace-road, London, S.W. 1.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—During the month of February a four weeks' course in Children's Diseases will be given by the members of the staff at the four following institutions: Paddington Green Children's Hospital, Royal Waterloo Hospital for Children and Women, Victoria Hospital for Children, and the "Children's Clinic" at the Western General Dispensary. The course will embrace lectures and clinical demonstrations on Medical and Surgical Diseases of Children and also the special departments, including dermatology, nose and throat, diseases of the eye, and clinical laboratory demonstrations. As already announced, a special intensive course is being held at the North-East London Post-Graduate College, Prince of Wales's General Hospital, Tottenham, N. 15, from Feb. 4th to Feb. 16th. A special course in ophthalmology will be given at the Central London Ophthalmic Hospital, Judd-street, from Jan. 28th to Feb. 22nd. The course will consist of clinical lectures and demonstrations, and include the use of the ophthalmoscope, &c. Further particulars and copies of the syllabus for all these courses can be obtained from the Secretary to the Fellowship at No. 1, Wimpole-street, London, W. 1.

DONATIONS AND BEQUESTS.—The late Mr. George Frederick Milnthorp left by will £1000 to the Doncaster Royal Infirmary and Dispensary.—By will the late Mrs. Emily Gertrude Pye-Smith, widow of Dr. Philip Henry Pye-Smith, among other bequests, left £1000 to the Governors of Guy's Hospital to endow a bed to be called the "Dr. Pye-Smith Bed," and to the Royal College of Physicians her late husband's gold medals.—Under the will of the late Mr. William Thomas Rushton, the testator left, among other bequests, £250 each to the Queen's Hospital, Birmingham, and the Birmingham General Hospital; £200 each to the Birmingham Deaf and Dumb Institution; the General Institution for the Blind, Carpenter-road, Edgbaston; the Birmingham and Midland Ear and Throat Hospital; the Birmingham and Midland Hospital for Women; the Birmingham Eye Hospital; the Royal Orthopædic and Spinal Hospital; £100 each to the Birmingham Dental Hospital; the Birmingham and District Cripples Union; the Women's Hospital, Birmingham; the Birmingham Maternity Hospital; the Taylor Memorial Home of Rest, Sparkhill, Birmingham; the Bromsgrove Cottage Hospital; the Blackwell Sanatorium; and St. Dunstan's Home for Blinded Soldiers, London.

LECTURES on (1) Headache, (2) Rheumatism, (3) Gout, and (4) Obesity will be delivered by Sir Robert Armstrong-Jones at Gresham College, Basinghall-street, London, E.C., on Jan. 29th, 30th, 31st, and Feb. 1st respectively at 6 P.M. Admission is free.

IN the recent New Year Honours Dr. Alexander Hendry, M.V.O., of Ballater, was created a Commander of the Royal Victorian Order. Dr. Hendry is well known in Upper Deeside as a successful medical practitioner and also represents that district in the Aberdeenshire Education Authority. He is also a justice of the peace for the county and a member of the Deeside District Licensing Court.

KINGSEAT MENTAL HOSPITAL.—The Aberdeen City District Board of Control met on Jan. 8th to discuss the proposed extension of the hospital. Mr. Thomas Mitchell presided. Approval was given to erect additional villas at Kingseat Asylum and increased accommodation in the nurses' home. The estimate of cost was £43,000. The sketch of the plans suggested by the consulting architect to be first brought before the district board for adoption.

MEDICAL PRAYER UNION.—A meeting will be held at the London (R.F.H.) School of Medicine for Women, Hunter-street, Brunswick-square, London, W.C., on Jan. 24th. The Medical School will be open for inspection at 4.30 P.M. and the meeting will begin at 5.30 P.M. when an address will be given by Dr. Douglas Adam. Those who intend to be present are asked to inform Dr. Tom Jays, the Hon. Secretary, Livingstone College, Leyton, E. 10.

PUBLIC DENTAL SERVICE ASSOCIATION.—The fifth annual dinner of the East Lancashire and East Cheshire Branch of this Association was held recently in Manchester. The chairman, Mr. P. I. Wigoder, said that it was estimated that from 20 to 40 per cent. of the children attending schools were suffering from grave dental defects, and that 70 per cent. needed some dental treatment. In Manchester only four school clinics had been established instead of the 18 originally proposed. It was, however, with the question of adult dental disease that the Association was chiefly concerned, as it was estimated that half of the ill-health of the industrial classes was due, directly or indirectly, to defective teeth. At present the Association could only cope with this problem by coöperating with the approved societies who were making provision for dental treatment out of their surplus funds. The members of the Association were prepared to give their services to the societies on an agreed scale of remuneration. Mr. Walter Davies, chairman of the Manchester Insurance Committee, expressed the opinion that the State would never secure the measure of public health it aimed at until it made provision for using the services of dentists as it had made for using the services of the doctors. Provision for dental treatment at present could only be made by approved societies out of their surplus funds. It was hoped that at no distant date dental treatment would be included as one of the general benefits under the Act. This would mean that in Manchester half the population would be placed automatically in the hands of the dentists.

EDUCATIONAL TOURS FOR MEDICAL OFFICIALS.—By request of the Ministry of Health, the Society of Medical Officers of Health has undertaken the selection of representatives from the United Kingdom to take part in the interchanges of health officers organised by the Health Section of the League of Nations. For a course in general health administration to be held in the Netherlands (April 24th–May 30th) the Society has nominated Dr. A. T. Nankivell, M.O.H. of Hornsey, and Dr. T. S. McIntosh, M.O.H. of the Hendon Urban District. For a similar course in Denmark (June 1st–July 14th) the British representatives will be Dr. F. T. H. Wood, M.O.H. of Bootle, and a medical officer of the Ministry of Health. A third course in general health administration to be held in Switzerland (August 10th–Sept. 20th) will be attended by Dr. A. B. McMaster, M.O.H. of Dover, and Dr. W. H. Davison, Assistant M.O.H. of Birmingham. The Society has also nominated Dr. W. H. Dickinson, of the Newcastle-on-Tyne Health Department, for a course in anti-tuberculosis work to be held in Austria, France, Hungary, Belgium, Switzerland, and other European countries from February 6th to April 30th. Dr. Raymond Gamlin, senior assistant school medical officer at Liverpool, has been selected for a European course in school medical work the dates for which are not yet fixed. All the nominations are subject to the consent of local authorities to grant the necessary leave of absence. The Health Section of the League of Nations is enabled to defray the expenses of the courses by a generous grant from the Rockefeller Trustees.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear it if reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W.
THURSDAY, Jan. 24th, at 4.30 P.M.—*Papers to be read*:—H. G. Cannon: On the Development of an Estherid Crustacean. (Communicated by Prof. E. W. MacBride.)
Papers to be read in title only:—C. Shearer: The Oxygen Consumption Rate of Parts of the Chick Embryo and Fragments of the Earthworm. N. Annandale, D.Sc.: The Evolution of the Shell-Sculpture in Freshwater Snails of the Family Viviparidæ. (Communicated by Lieut.-Colonel A. Alcock.) Prof. B. Sahni: *Tmesipteris Vieillardi* Dangeard. An erect Terrestrial species from New Caledonia. (Communicated by Prof. A. C. Seward.) P. A. Buxton: Heat, Moisture, and Animal Life in Deserts. (Communicated by Prof. J. S. Gardiner.) A. W. Bellamy and Prof. C. M. Child: Susceptibility in Amphibian Development. (Communicated by Prof. E. W. MacBride.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Jan. 21st.

SPECIAL DISCUSSION: at 5 P.M.
On the Grading of the Population from the Point of View of Bodily Fitness, to be opened by Air-Commodore David Munro, R.A.F., followed by Sir Arthur Keith, Sir Duncan Rhind, Dr. John Wallace, and others.

Wednesday, Jan. 23rd.

COMPARATIVE MEDICINE: at 5 P.M.
Paper:
Prof. E. Mellanby: Diseases of Nutrition in Animals. The paper will be followed by a discussion, in which the following will take part: Prof. J. B. Buxton, Miss Harriette Chick, Mr. Henry Gray, Mr. G. H. Livesey, Prof. C. J. Martin, and Prof. M. S. Pembrey.

Friday, Jan. 25th.

STUDY OF DISEASE IN CHILDREN: at 5 P.M. (Cases at 4.30 P.M.)
Cases:
Dr. Geoffrey Evans: Case of Interstitial Nephritis in a Child.
Dr. C. Worster-Drought: Juvenile Tabes Dorsalis in a girl aged 10 years.
Dr. W. M. Feldman: Case for Diagnosis.
Mr. O. L. Addison: Specimen (the Spleen) of a Case of "Gaucher Splenomegaly."
Other cases will be shown.

EPIDEMIOLOGY AND STATE MEDICINE: at 8 P.M.
Paper:
Dr. J. Kerr: Refuse Disposal in Relation to the Enteric Group of Diseases.

ROYAL INSTITUTION OF GREAT BRITAIN, 21, Albemarle-street, W. 1.
TUESDAY, Jan. 22nd.—5.15 P.M., Dr. W. E. Dixon: Drug Addictions. (Lecture II.)

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Jan. 23rd.—4 P.M., Dr. G. L. Cox: Organisation of County Schemes for Prevention of Tuberculosis.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Jan. 21st to FRIDAY, Jan. 25th.—NORTH-EASTERN FEVER HOSPITAL. Wed. and Sat., 11 A.M., Dr. Frederic Thomson: Diagnosis and Treatment of the Acute Infectious Diseases.—ST. PETER'S HOSPITAL FOR STONE. Mon., 2 P.M., Mr. Andrews: Injuries of the Urinary Organs: Tues., 2 P.M., Mr. Joly: Urinary Calculi and Calculous Disease; Wed., 2 P.M., Mr. Morson: Tumours of the Urinary Tract; Thurs., 2 P.M., Mr. F. J. F. Barrington: Non-tuberculous Infections of the Urinary Tract; Fri., 2 P.M., Sir John Thomson-Walker: Urinary Obstruction; Sat., 2 P.M., Mr. Harkness: Urethritis in the Male.—WEST END HOSPITAL FOR NERVOUS DISEASES, at 73, Welbeck-street, W. 1. Mon., 1.30 P.M., Dr. Harry Campbell: Cerebral Tumour, Hemiplegia; Tues., 5 P.M., Dr. Ridley Prentice: The Significance of Absent Knee- and Ankle-Jerks; Fri., 5 P.M., Dr. C. Worster-Drought: Neurosyphilis, Diagnosis and Treatment.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Jan. 21st.—5 P.M., Prof. St. Leger Brockman: The Problem of Drainage in Acute Appendicitis.
WEDNESDAY.—5 P.M., Prof. R. Handfield-Jones: Retro-peritoneal Cysts, their Pathology, Diagnoses, and Treatment.
FRIDAY.—5 P.M., Prof. S. Forsdike: Cancer of the Cervix.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Jan. 21st.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Simson: Diseases of Women.
TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—10.30 A.M., Dr. Pritchard: Medical Wards. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Banks-Davis: Throat, Nose and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Jan. 24th.—4 P.M., Dr. Nabarro: Cerebro-spinal Fluid and its Value in Diagnosis.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Jan. 24th.—5 P.M., Mr. Banister: Late Manifestations of Puerperal Sepsis.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, Jan. 23rd.—4.30 P.M., Mr. C. Rowntree: Radium and its Surgical Uses.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Jan. 22nd.—5 P.M., Dr. H. Davis: Dermatitis Artefacta.
THURSDAY.—5 P.M., Dr. H. MacCormac: Animal Parasites (Chesterfield Lecture).

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURES (at Whitworth-street West Branch).
FRIDAY, Jan. 25th.—4.30 P.M., Mr. Morley: Pyloric Stenosis in Infancy.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Jan. 21st.—(At the Children's Hospital.) Mr. Leathart: Reasons for Removal of Tonsils and Adenoids.
TUESDAY.—(At the Southern Hospital.) Dr. Frank H. Barendt: Scaly Eruptions.
WEDNESDAY.—(At the Northern Hospital.) Dr. Pemberton: Treatment of Diabetes Mellitus.
THURSDAY.—(At the Stanley Hospital.) Dr. Wadsworth: Artificial Pneumothorax.
FRIDAY.—(At the Royal Infirmary.) Prof. Glynn: Some Points in Clinical Pathology.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES.
FRIDAY, Jan. 25th.—3.30 P.M. (At the Royal Infirmary.) Dr. Yates: Psychotherapy.

Appointments.

BLACKABY, E. J., M.R.C.S., L.R.C.P. Lond., has been appointed House Surgeon to the Royal Infirmary, Sunderland.
COUNIHAN, J. H., M.B., B.Ch. Dub., Coroner for North County Clare.
COUTTS, N. M., M.B., B.S. Lond., House Surgeon, Children's Hospital, Sunderland.
FORD, R. K., M.B., B.S. Lond., Medical Officer of the Poor-law Institution and Infirmary and the Children's Homes, Darlington.
FORWARD, F. E., F.R.C.S. Eng., Medical Officer of Parkhurst Prison.
GRANT, MARJORIE, M.B., Ch.B. Manch., and KING, MARJORIE,, M.B., Ch.B. Edin., Assistant School Medical Officers for Cheshire.
JOHNSON, W. P. S., M.D., Ch.B. Edin., Medical Officer to the County of Fife Venereal Diseases Joint Committee.
WOOD, J. W., M.B., Ch.B. Aberd., Honorary Aural Surgeon to the Eye and Ear Hospital, Tunbridge Wells.
Certifying Surgeons under the Factory and Workshop Acts: RAYNER, E. C., M.R.C.S., L.R.C.P. Lond. (Dulverton); COURTNEY, J. M., M.R.C.S., L.R.C.P. Lond. (Lynton); and SMITH, C. R., M.B., B.S. Durh. (Beccles).

Vacancies.

For further information refer to the advertisement columns.

Birmingham, Queen's Hospital.—P. to Out-patients. £50.
Birmingham Union, Dudley-road Hospital.—Res. P. £650. Also Res. Asst. M.O. £300.
Bolton Infirmary and Dispensary.—Asst. H.S. £100.
Cheshire Joint Sanatorium, Market Drayton, Salop.—Second Asst. M.O. £350.

Chester Royal Infirmary.—Asst. H.S. £150.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. £125.
Elizabeth Garrett Anderson Hospital, Euston-road.—Asst. to Clin. Pathologist. £100.
Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—H.S. £175.
Hayward's Heath Hospital.—Hon. Consulting P.
Hemel Hempstead, West Herts Hospital.—R.M.O. £200.
Hospital for Sick Children, Great Ormond-street, W.C.—Cas. O. Also Asst. Pathologist. Each £400.
Hull Royal Infirmary.—Sen. H.S. £200.
Laboratories of Pathology and Public Health, 6, Harley-street, W.—Fourth Asst. Pathologist. £500.
Lancashire County Mental Hospital, Winwick, Warrington.—A.M.O. £432.
Liverpool, Royal Southern Hospital.—Res. Cas. O. £150. Also H.P.'s and H.S.'s. Each £100.
London Lock Hospitals, 283, Harrow-road, W. 9, and 91, Dean-street, W. 1.—Hon. Ophth. S.
Manchester, Royal Children's Hospital, Gartside-street—Asst. M.O. £150.
Manchester Royal Eye Hospital.—H.S.
Manchester Royal Infirmary.—Asst. M.O. in Radiological Dept. £105.
Miller General Hospital for South-East London, Greenwich-road, S.E. 10.—H.P. £150.
Orkney, Parish of Eday.—M.O.
Orpington, Kent, Ministry of Pensions Hospital.—Consultant P. £450.
Penshurst, Kent, Cassel Hospital for Functional Nervous Disorders. Res. M.O. £500.
Plaistow Fever Hospital.—Second Asst. M.O. £200.
Royal Army Medical Corps.—Commissions.
St. Thomas's Hospital Medical School.—Demonstrator of Anatomy. £400.
Salisbury General Infirmary.—Asst. H.S. £150.
Sheffield Royal Hospital.—Cas. O. £150.
South London Hospital for Women, South Side, Clapham Common, S.W. 4.—Asst. S.

The Chief Inspector of Factories, Home Office, London, S.W., announces vacancies at Epsom, Harpenden, and Coniston.

Births, Marriages, and Deaths.

BIRTHS.

BANKS.—On Jan. 8th, at Ty Mawr, Aberdare, the wife of Harry Banks, F.R.C.S., of a daughter.
HODGES.—On Jan. 13th, at Boscombe Court, Boscombe, Hants, the wife of Arthur Noel Hodges, M.D., of a daughter.
WILSON.—On Jan. 6th, at "Stonefield," Blackheath, the wife of Captain Colin Wilson, R.A.M.C., of a daughter.

DEATHS.

LATIMER.—On Jan. 10th, at Oakdale-road, Tunbridge Wells, Henry Arthur Latimer, M.D. (late of Swansea, South Wales), in his 75th year.
MARTIN.—On Jan. 9th, following an operation at a nursing home in London, Henry J. W. Martin, M.R.C.S. Eng., aged 68.
ROPER.—On Jan. 11th, at The Shrubbery, Exeter, of pneumonia, Arthur Charles Roper, F.R.C.S. Edin., J.P., aged 65.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts

THE USE AND ABUSE OF PHYSICAL TREATMENT.[1]

BY JAMES B. MENNELL, M.D., B.C. CAMB.

IN its early days, some 25 years ago, the Chartered Society of Massage and Medical Gymnastics was known as the Incorporated Society of Trained Masseuses. To give an idea of the uphill fight of physical treatment in this country I may say that 15 years ago, when I first began to take an active interest in the subject, a deputation of my fellow house officers at hospital waited upon me to request me not to degrade my profession by studying such a very doubtful branch of medical practice. It seemed then that the best I could hope for our generation was that we should sow the ground for others to reap the harvest, but our work has advanced so rapidly in recent years that I still hope to see physical treatment fully established in the prominent position in the medical armamentarium which it seems to me it should hold. The formation of each of these lecture centres marks a definite step forward in the progress of physical treatment, and I think that nothing can now undo the work of the past.

The uses of physical treatment are, I think, fairly universally admitted, though unfortunately the variety of its uses are still unknown, and still less are its abuses known and realised. Those of us who practise physical treatment are mainly regarded as a last resource; patients come to us when every other known means of helping them has failed to find, even after suffering pain and disability for 20 years, that in physical treatment they are able to secure relief.

Massage as a Curative Agency.

It seems to me futile to try to trace the history of massage back into antiquity; there can be little doubt that the first occasion on which massage was applied to a human limb was the day on which our earliest ancestor began laborious work. Massage is, to all intents and purposes, instinctive not only throughout the human race, but also in a large section of the animal kingdom. Yet I think that the more thoughtful of us realise that the more we see of the use of massage, the less we come to rely on it alone as a curative agency. I do not wish to appear to belittle the value of massage; but it should be used largely as a means to an end, and preferably at the beginning of treatment. Many people labour under the delusion that they possess a supernatural power of healing in their hands; to me this conception is utter balderdash, long experience leading me to regard such people as the most unreliable of the members of their profession.

Putting aside the obvious dangers which beset even a masseur, such as the request for massage in cases of malignant growth, or where thrombosis has occurred, one other danger—psychical, not physical—is all too little realised. It is far easier to rub a disability into a patient's mind than to rub it out of his limb. If 10 minutes' massage is necessary, and 20 minutes' massage is given, surely we convey to the patient's mind the undesirable suggestion that the condition is 100 per cent. more serious than in fact it is.

One masseuse to be avoided, then, is the one who prides herself on giving her full hour of massage to every case, another is the one who sits down and works automatically with her thoughts obviously not on her work. The proficient masseuse should be able at any moment to give a reasoned and intelligent reply to the question, "What are you doing that for, how often have you done it, and how often do you propose to do it in order to secure the fullest physiological result?" This may be an unattainable ideal, but physical treatment must not be blamed for failure to effect a cure if, through lack of adequate instruction, the masseuse is left in ignorance of the exact condition she is called upon to treat. Neither by training, nor, as a rule, by experience, is she a diagnostician.

Instances of Conditions Unaffected by Massage.

In a case of pain in the lower extremity due to sacro-iliac or to lumbo-sacral strain, only by the mercy of Providence can massage possibly be of any service. In brachial neuritis if the pain is due to reflex irritation from fibrositic deposits round the scapula or to adhesions within the shoulder-joint physical treatment applied to the arm is not only useless but liable to increase, rather than decrease, the irritation. It is a comparatively simple matter to explain the massage

[1] An abstract of a lecture delivered on Nov. 20th, 1923, at the opening of the Lecture Centre of the Chartered Society of Massage and Medical Gymnastics at Eastbourne.

treatment of any individual case to any reasonably intelligent and skilled individual, but it requires a very unusual amount of both skill and experience to be able to prescribe the correct form of treatment for every case.

Massage treatment may be rendered not only futile, but definitely harmful; not infrequently, more harm than good is done by this treatment in cases of infantile paralysis and other forms of flaccid paralysis. A common phrase, long used amongst those who practise massage, is that of "working up a muscle"—which means, presumably, that as a direct result of massage treatment, muscle strength can be built up. In my opinion the latter possibility is a mere delusion, probably arising from the following type of case: A patient after, say, a severe attack of typhoid, may have very considerable wasting of the muscles; massage is ordered, and activity may shortly seem to return, with increase of muscle bulk. I submit that this increase of muscle is a secondary, not a primary, result. The massage produces a sense of well-being and returned vitality; the resulting desire for spontaneous movement enables the patient to start along the path of recuperation, but I am convinced that no strength was ever built up as the direct result of massage. Massage assists the circulation in the removal of waste products, and maintains it through the part, but cannot possibly secure one single voluntary contraction.

In the cases of nerve injury encountered in such numbers during the war, some of the nerve operations were complete failures in every respect. Recovery was not only delayed, but also permanently impossible to effect by physical or any other means. Yet amongst cases where nerve suture was successful were some presenting an apparently amazing rapidity of recovery; other cases are recorded where recovery has been regarded as so hopeless that a tendon transplantation has been performed, whilst a few weeks later muscle recovery has taken place in the paralysed muscle. I believe, however, that one of the curses attendant upon those who suffer from a flaccid paralysis is the somewhat widespread belief—amongst those who practise physical treatment and others—that voluntary action in a paralysed muscle cannot be secured until a faradic response can be elicited. I am absolutely convinced in my own mind of the fallacy of this belief, but it generally holds good if the person to whom the care of the patient is entrusted is not expert in muscle training; for a psychical block to voluntary impulses, no less than a physical obstruction, can exist in a nerve connexion.

Muscle Training.

Muscle training is an art apart; it calls for an intimate knowledge of anatomy, and of muscle function, which is quite another subject. The prime mover must be held distinct from the synergist—direct or static, and the action of the antagonists must be fully known. Then, too, there are some dozen laws to be regarded in all muscle training, and neglect of one transforms success into failure. It is perhaps in muscle training that expert skill shows itself more plainly than in any other branch of physical treatment, except perhaps in the treatment of the more serious cases of recent injury.

Following on the same line of thought it is, of course, a matter of common knowledge that the apparent paralysis present after an attack of infantile paralysis is far more extensive than is justified by the actual lesion. Nearly always is it possible to hope for some recovery when the patient is seen for the first time; yet of this I am sure, that a certain amount of recovery, though possible, only too often fails to take place merely because the paralysis still continues to exist in the patient's mind. He who holds the faith that massage can "work up a muscle," or that electrical stimulation of a muscle is going to cure his patient, places his faith in a broken reed, and perhaps the greatest danger in electrical treatment of a muscle is that it may enforce upon the patient's mind the idea that his muscle can only move in response to electrical stimulation. When we remember that the earliest contractions can only be elicited in certain positions and under certain circumstances, I think it is possible to realise how recovery can be postponed, not only through lack of physical treatment, but perhaps directly because of lack of skill in the administration thereof.

The surgeon can render recovery possible, but the recovery in the end depends on the patient and his own volition.

Then let us consider the treatment of a patient after injury or operation. To some, perhaps, I am known as the English disciple of Just Lucas-Championnière; I have probably been responsible for the treatment of 500 or 600 cases of fracture of the lower end of the humerus in children; in all of them I have used massage and mobilisation from the very outset, and never since the earliest days have I had cause to regret it. Yet throughout this country and in America the general belief is that this fracture should not be so treated. Lack of knowledge of manipulative dexterity and technique is the basis on which this belief is built. I was once complimented by an eminent surgeon on the "moral control" that I had over the children who had sustained fracture, and who were receiving treatment in my department; I pointed out that what he had witnessed was the result of manipulative dexterity on the part of my staff.

With regard to the treatment of children with fractures near the elbow-joint, if such treatment is painful the patient is suffering from abuse, not from use, of treatment. Rarely, if ever, do I allow massage of any sort to be administered to these patients after the first few days; and, as regards mobilisation, any movement administered during the first two weeks must be passive in the true sense of the word—in other words, it must be administered only while the muscles throughout the limb are in a condition of complete relaxation.

In a vast number of cases physical treatment is applied and found wanting. In those complaints, known variously as brachial neuritis, lumbago, and sciatica, physical treatment is often meted out as a last resource; massage is applied, and often the patient is worse as a result. Ionization is given, or perhaps diathermy, radiant heat, or light treatment, and the patient is comforted but not cured. Yet physical treatment properly applied is frequently the one and only curative agency. The more I see of these cases the less I believe in the existence as a general rule of a true neuritis. Do not think for one moment that I deny the existence of a true sciatica; I am sure, however, that it is a condition very rare when compared with others capable of producing the most intense pain along the course of any nerve in the lower extremity. The one cardinal sign of true sciatica—namely, pain when the hip is flexed upon the trunk and the knee extended—is accepted as diagnostic if pain is produced; bad luck has it that this, too, is one of the cardinal signs of a far more common condition often producing nearly identical symptoms—namely, sacro-iliac strain. Is it any wonder, therefore, that physical treatment for sciatica and lumbago fails us when the only possible hope of cure or even of relief rests either in manipulation of the joint or in affording it support with a belt?

Fibrositic Deposits causing Sciatica or Neuritis.

Another fertile source of so-called sciatica or neuritis is the presence of fibrositic deposits, capable of causing the most intense reflex irritation along the course of various nerve trunks. We know little enough about these fibrositic indurations, but of their existence I am absolutely firmly convinced. I am slowly coming to realise that in certain positions these deposits are capable of causing referred pain down the course of definite nerve trunks. Such deposits are (very occasionally) found under the scalp, then in the occipital region, then at any point in the muscle mass between the cervical spinous processes and the transverse processes and, less frequently, just in front of the transverse processes. Here, however, I would add one word of warning. It has often been my lot to be told that a patient has an intensely sensitive spot which no amount of friction has succeeded in dispersing, and on examination this has not surprised me, as I know of no means by which the tubercles of the transverse processes of the vertebræ can be removed short of operation. Then there are two favourite spots for these deposits around the scapula. One has been mentioned, a second is to be found by placing the hand of the affected side upon the opposite shoulder, and then pressing deeply against the chest wall just opposite the base of the spine of the scapula. They occur, too, in a most inaccessible position—namely, between the body of the scapula and the chest wall. Fortunately the condition is not very common, but when it does occur it is capable of producing the most intense pain throughout the upper extremity. It can only be dealt with by exerting deep pressure on the scapula against the chest wall, while the former, so to speak, is ground firmly against the latter. Then they can occur in both supra- and infra-spinatus about the level of the acromio-clavicular joint, but in this position they must not, of course, be confused with arthritis or strain of this joint. Passing down the arm, they are to be found, comparatively rarely however, near the insertion of the deltoid, the origin of brachialis anticus, in front of the condyles of the humerus, and I have often been told that one has been discovered on deep pressure on the outer side of the forearm near the head of the radius. I question the existence of this spot, as when I have examined it, it is one of the normally painful spots on deep pressure. Then we come to two more painful spots which are a fertile source of so-called "writer's cramp." One is a nodal thickening perhaps in, perhaps near, the median nerve about a hand's breadth above the wrist-joint, and the other, apparently a true fibrositic deposit, just distal to and slightly internal to the trapezium in the palm.

Returning to the trunk, one spot occurring with remarkable frequency in patients suffering from brachial neuritis is in the third intercostal space in front somewhere about the nipple line. Unless this is dealt with effectively many a

case of brachial neuritis will fail to clear up. Deposits capable of causing referred pain are also found anywhere along the line which represents the outer limit of the erector spinæ, and a particularly unenviable lot is that of the patient where one of these spots is discovered in the angle formed by this line and the lower border of the twelfth rib. I think you will frequently find that this is present in those patients who are able to start off for a walk without a twinge or flicker of pain, and who yet, after going a variable distance, begin to feel intense pain creeping on until they are compelled to sit down and rest after having traversed a comparatively short distance. Around the transverse processes of the first lumbar vertebra we are also liable to discover more of these deposits, though, curiously enough, it would seem that they are not very common in the remainder of the lumbar region until we come to the gluteal region already referred to. Again, it is common for me to be told that a painful spot has been discovered near the junction of the ilium with the sacrum, but experience has taught me that this is indicative of strain of the sacro-iliac joint. I believe deposits here to be very rare. In the gluteal region not only are deposits to be found round the crest of the ilium, but they are also frequently to be found on deep pressure over the edge of the great sacro-sciatic notch. Passing downwards they are comparatively rare until (why, I do not know) we reach the neighbourhood of the knee-joint where two spots can not infrequently be discovered on deep pressure between the heads of the gastrocnemius and the tibia. Occasionally one may be found in the sole of the foot, even if the patient presents no evidence whatever of flat-foot or other cause of strain or trauma. It is not uncommon, I believe, to consider that pain due to a traumatic metatarsalgia which presents pain on pressure can be cured by massage; the latter treatment may ease but can never cure. The moral of all this is simply that physical treatment rightly applied can be curative; wrongly applied, it is not only futile, but capable of inspiring in the patient's mind a feeling of despair which renders him completely incapable of enjoying a life which is so interwoven, apparently without hope, with pain and suffering.

Pain in the Feet.

It is customary to consider that a patient who complains of pain in the feet is making an undue fuss, but the patients who display the greatest gratitude are those whom I am able to relieve in this respect. Manipulation can sometimes do much, but either manipulation or massage can seldom do more than afford very transitory relief. The faradic footbath, on the other hand, is a definite remedial agent, and this, combined with a proper support (hard to secure unless you make it yourself), can, I believe, be relied upon to secure relief until the patient is sufficiently recovered to build up his own muscle strength, and so effect his own recovery. When actual deformity has taken place, it means the permanent use of adequate support. For some time past, however, I have come to the conclusion that unless there are definite arthritic changes in the intertarsal joints, no foot condition is so bad that pain in it cannot be relieved by purely physical means, which, of course, include support. On the other hand, if there is a definite arthritis in a joint such as the subastragaloid joint, as, for instance, after fracture of the os calcis, nothing but fixation of the joint can possibly relieve the pain.

Flat-Foot.

Putting aside the question of footgear, treatment by physical exercises is most commonly prescribed for flat-foot. Here failure in treatment is, I think, due to one of two causes. In the first place, no amount of massage or electrical treatment will ever succeed in loosening joints which have become stiff, for this is essentially the function of manipulative treatment; secondly, no amount of re-education of the muscles which support the arch of the foot can possibly prove effective if the stance and position of the feet in walking remain uncorrected. It is for this reason that I always tell my students that the most important muscle to educate in patients suffering from flat-feet is the quadriceps extensor. Teach your patient to stand with feet parallel and the knees braced back, and to walk with the feet parallel instead of everted, and the success of the other forms of treatment is comparatively certain; whereas, without this special training, failure, or at least relapse, is almost equally certain.

Joint Manipulation.

I believe that during the war a general order was issued prohibiting the manipulative treatment of stiff hands under an anæsthetic after septic gunshot wounds of the upper extremity. And yet we knew full well that these manipulations were being performed by a limited few with the utmost success, though, for the most part, the operation was attended by failure. The manipulative treatment of joints is a special art requiring special study and special skill in execution. With the solitary exception of the hip joint, in few, if any, joints in the whole body is it impossible to perform some definite movement not ordinarily under the patient's voluntary control. Again, movements in joints are by no means always what they seem. Flexion of the finger, for instance, is not a hinge movement, but a gliding movement; with the proximal end of the lateral ligaments as centre and their distal insertion as radius the base of the phalanx describes a circle. If this circle is not described, and if flexion is performed without the sliding movement involved in the circular movement of the base of the phalanx round the head of the proximal bone, severe damage is inevitable.

Mobilisation Treatment.

Performed in the right way, mobilisation treatment may be a potent influence for good; performed in the wrong way it is equally potent for evil. This subject is, of course, mixed up with what is commonly known as the art of bone setting, and the question arises, Is there, or is there not anything whatever in the bone-setter's story of the "little bone" being out of place? The ordinary unqualified practitioner usually attributes pain in a joint to some definite displacement of the bones which enter into the formation of the joint, and claims that the relief which he is at times able to secure is due to a demonstrable reduction of the bony displacement. That minor displacements of bone do, in certain cases, exist, and do cause symptoms, I am firmly convinced. But it is possible, under certain circumstances, for a locking to take place within many of our joints, in spite of the fact that there is no discernible displacement. It is, as a rule, impossible that this locking should be overcome merely by the performance of the ordinary movements which take place in the joint; indeed, the forcible performance of these movements will often do harm rather than good. It is essential, therefore, if the manipulative treatment of joints is to be undertaken at all with any prospect of success, that the manipulator should be acquainted with those movements which take place at joints and which are not under the voluntary control of the patient, and that he should know how to perform them so as to ensure that any locking which may have taken place is undone before he attempts to force the ordinary movements of the joint that are under voluntary control.

Massage and Obstetrics.

Even in the unexpected field of the obstetrical department physical treatment finds its place; it is becoming more and more recognised how advantageous it is for an infant to receive its natural food, at any rate during the earlier months of life. When, however, the supply is running low, we have not by any means universally recognised as yet that in massage we have perhaps the most potent agency of all for restoring the activities of the source of supply. Then, too, as in all medicine and surgery, the highest glory is attained on the preventive side; thus the practice of physical exercise treatment after confinement is valuable.

Massage in Functional Diseases of the Central Nervous System.

In organic disease of the central nervous system it is obvious that, for the most part, physical treatment is the only agency which can materially help, although it can do nothing to cure. In functional nervous disease, however, we have an entirely different story; it is difficult to imagine any treatment more pernicious than massage as a means for curing the hysteric—unless indeed it is used, or rather abused, by transforming it into a form of physical punishment. Surely to apply massage in these cases is simply to back up the conscious against the subconscious; whereas, of course, the only hope of success is the reverse process of backing up the subconscious against the conscious. Anything may be used as a means of conveying a curative suggestion, but massage should not be employed as a remedy for a mental condition. Yet there are three golden rules of treatment which, if they are observed, will render massage treatment for the neurasthenic by far the most potent agent we have at our disposal. They are quite simple: Any tender or hypersensitive point should receive attention last; all of the so-called stimulating movements of massage must be prohibited; otherwise, the nature of the movements performed is absolutely immaterial, provided that they are rhythmical. If these laws are faithfully obeyed, massage is the one sovereign cure for insomnia: disregard them and disaster must follow.

Other rules in the treatment of all cases of recent injury and of other patients where function is to be restored, are these: If as a result of treatment there is any increase of pain, increase of swelling, or decrease of mobility, something has gone wrong, or too much has been done; whereas with decrease of pain, decrease of swelling, and increase of mobility the right road has been attained, and it is safe to proceed along it.

May I close by pointing a moral? Physical treatment is expert work, and should be left only in expert hands if it is to be successful. Do not blame physical treatment if it fails when confided to the untrained practitioner; rather lay the blame at the door of those who, being so ignorant of physical treatment themselves, fail to recognise the high degree of skill which may be required to provide adequate treatment for any individual case. This skill can only be the outcome of prolonged training as a preliminary to experience and practice.

HEALTH SERVICE OF IRAQ (MESOPOTAMIA).

A REPORT by the High Commissioner (Major-General Sir Percy Z. Cox) on the administration and condition of the Iraq for the period from Oct. 1st, 1920, to March 31st, 1922, has been issued as a Parliamentary paper. In the section devoted to health service it is stated that certain dispensaries have been closed, and that the following institutions have been opened (or reopened): civil hospitals at Diwaniyah and Samawah, and civil dispensaries at Baghdad West, Hindiyah Barrage, and Fallujah. Nine British officers on the staff resigned during the period: one, Dr. A. C. Oldham (Ahwaz), died; and five were recruited. Two British nursing sisters resigned; one, Miss E. Kidd (Basrah), died; and 12 were recruited. Five local doctors resigned and eight joined the service. Many of these are part-time officials. Difficulty has always been experienced in getting local doctors to take whole-time appointments. This is due mainly to a shortage of qualified medical practitioners in the large towns, and partly to the disinclination of the Iraqi doctor (usually city bred) to leave his home and serve in an out-station. The institutions of the health service provide a total of 1539 beds for in-patients, in addition to which the railway hospitals provide 99. During the year ending March 31st, 1922, 18,926 in-patients were admitted, of whom 15,582 were discharged and 1223 died; 607,484 out-patients (old and new cases) were treated. The following infectious cases were notified during the year: cerebro-spinal meningitis, 26; plague, 137; small-pox, 475; typhus, 61; chicken-pox, 90; measles, 605; mumps, 92; tuberculosis (all kinds), 178; typhoid, 87. These figures, however, represent only a fraction of the cases, and are in the main confined to the large municipalities. It is extremely difficult to obtain satisfactory notification in face of the conservatism of the native, his dislike of the disinfection of his home, and other troubles entailed by the discovery of infectious disease therein. Tuberculosis is notified much more freely than other diseases. Measles assumed epidemic proportions during the first half of the year, but after May gradually subsided. A small outbreak of plague occurred in May, June, and July. Small-pox became epidemic in the second half of the year. The majority of the cases were notified in Baghdad and Basrah, but the disease was much more widely spread throughout the country than indicated by the figures. The epidemic reached its summit in the first half of December, after which the figures dropped suddenly. Cholera has been notable by its absence, and there have been very few cases of typhus and relapsing fever.

The X Ray Institute, Baghdad, is the central radiographic institution of the country, and is also the depôt for supplies and repairs to all civil and military X ray installations. It is fully equipped with the latest radiographic and electrotherapeutic apparatus. A branch institute has been established at the Civil Hospital, Basrah. Arrangements have also been made to open another branch at Mosul. The work of the Vaccine Lymph Institute, Amarah, proceeded uneventfully. During the year 14,513 grammes of lymph (sufficient for 1,902,600 insertions) were manufactured and 7235 grammes issued. With this increased production it has become possible to keep in stock lymph of recent manufacture only, and lymph is now discarded as soon as it is 12 months old. The work of the laboratory of the Chemical Examiner's Department has continued at a high standard. The equipment is now complete and up to date; 376 samples were received for analysis, as compared with 313 in the previous year. The proportion of military work has decreased to about a tenth of the total. The laboratory is proving to be of considerable value to other departments, notably railway and excise. The Public Works Department is also beginning to refer to the chemical examiner for help and advice in such matters as concretes, cements, &c. Although the Rabies Institute at Baghdad is at present a military institution, it cannot be passed over without notice. Resulting from negotiations between the Director of Health Services and Government of India and the Assistant Director of Pathology, General Headquarters, Iraq, the institution commenced work in July, 1921: 159 cases have since been sent to the Institute for treatment. Of these, 137 underwent the full course. One refused treatment, and in other instances treatment was not considered necessary. The presence of the Institute in Iraq has resulted in an average monthly saving in passages alone of about Rs.3500, in so far as civilians are concerned, in view of the fact that previously all cases had to be sent to Kasauli, India.

For medical arrangements the railway system is divided into two sections, one extending from Makinah to Diwaniyah, and the other from Diwaniyah upwards, each being under a separate railway medical officer, and the whole being under the control of the chief railway medical officer at Baghdad. Railway dispensaries have been established at Makinah and nine other centres. During the early part of the period under review the treatment of railway employees was partly dependent on military hospitals. This dependence on the military has been gradually eliminated with the development of the Railway Medical Department, and during the latter part of the year, with the coöperation of the civil hospitals, attendances at or admissions to military hospitals have ceased. All sick now among railway employees, who cannot be treated at railway dispensaries, are received into civil hospitals, and practically the only patients dealt with by military hospitals are those requiring evacuation to India on medical grounds by ambulance transport. Owing to the large reduction in the imported railway personnel, the number of patients has considerably diminished, so that the pressure on civil hospitals has been much lessened, and this is noticeably so now, with the establishment of a new railway hospital at Baghdad West.

Up to a certain period the Iraq levies depended on the Civil Health Service for medical treatment, but on the reorganisation of the force a new Levy Medical Service was instituted under the control of Director of Health Services, with S.M.O. (who is also Assistant Director of Health Services), two R.A.M.C. inspecting officers, two assistant surgeons, eight sub-assistant surgeons, and two dressers on loan from military. In addition to this trained personnel, subordinate medical orderlies were supplied by levies. Instruction in medical and sanitary duties has been carried out. Now all the posts are provided with facilities for treatment to a finish, and for supervision by a British medical officer. Stations in Mosul, Arbil, Kirkuk, and Sulaimani took over the medical equipment left by the military, while small detention hospitals were instituted at Khanagin, Baghdad, Diwaniyah, Samawah, and Nasiriyah. The Civil Medical Stores supply medical equipment, and the Civil Health Service place their hospitals at the disposal of levies for the treatment of severe cases. The civil surgeon, Kirkuk, and civil surgeon, Sulaimani, officiate as levies medical officers, in addition to their other duties.

At the beginning of 1921 the Health Service transport consisted of two launches, five touring cars, 12 ambulances, and ten vanettes. Some of these were not in good order, having been running continually for two or three years. Running repairs were high, and the services of good drivers were difficult to obtain. Early in the year a reduction of four touring cars was effected, while the number of vanettes on actual duty was reduced to five, the rest being dismantled. Since then every effort has been made to utilise slow transport where possible; but it would seem that the present establishment is necessary for moderate efficiency.

HEALTH CONDITIONS IN TOGOLAND (WEST AFRICA).

A REPORT, prepared by Captain E. T. Mansfield, District Commissioner and Record Officer, on the British Mandated Sphere of Togoland for the year 1922, has been received at the Colonial Office. Amongst other interesting items it contains the following: "It is worthy of comment how eagerly the natives are seeking the aid of European medicine, and the long distances from which some of the patients travel to obtain it. . . . Native chiefs have instructions to report all cases of serious or infectious diseases without delay. This system has been proved very satisfactory by the fact that an outbreak of small-pox was immediately reported on a cocoa trade-route, and that, therefore, the possible beginning of an epidemic was controlled at its outset by the sanitary department and practically confined to one village. Medical attendance is given free to all paupers who care to apply for it, and for a nominal fee of 1s. to people of the labouring classes, whilst those who are known to be fairly well off are expected to pay higher fees. The medical officer performs a monthly tour through the districts. The most important diseases locally are venereal; the cases thereof treated during the year very easily outnumbered all others. Malaria and helminthiasis come next in importance and are very common; otherwise, except for injuries, many of which would be of a trivial nature if the natives possessed the most elementary ideas of sepsis, the local inhabitants appear to be fairly healthy on the whole. Sleeping sickness is met with, but is extremely rare, and leprosy also is not common. . . . There is no professional prostitution in the territory, the reason for this being that the morals of the people are so lax that what amounts to practically promiscuous fornication is so common that there is no room for such a class. It is quite a recognised business among a

certain section of the women, who go off to large centres to amass affluence in order to buy finery. A large number of the women from the southern section of the area frequent the brothels in Lome, which, it is understood, were in the past recognised and supervised by the German authorities, and have now been reintroduced by the French. Brothels are not recognised in British territories. No stigma appears to be attached to the profession. The whole subject of immorality and its attending diseases is of the utmost importance to the whole of West Africa, as it is one of the most potent factors limiting the increase of the population. . . . Restrictions on the importation and increase in the cost of alcohol have been the causes of inducing the inhabitants to resort to the excessive consumption of palm wine in the pine-growing areas. There are no other locally manufactured alcoholic liquors, except in the northern territories, where a quantity of corn beer is prepared. . . . The measures taken to assure the regulation and control of the importation, production, and consumption of dangerous drugs are prescribed by Rule 31 of 1921 under the Opium Ordinance of the Gold Coast Colony: 'Every application for the export to an importer of a supply of opium shall be accompanied by a certificate signed by the P.M.O. of the Gold Coast that the import of the consignment in question is approved by him, and is required for legitimate purposes. In the case of medicinal opium, morphine, heroine, and similar drugs, the certificate shall state specifically that they are required solely for medicinal or scientific purposes.' . . . Survivals of domestic slavery are still met with in the remote parts of the country, but it is impossible to furnish statistics, owing to the careful measures adopted by the slaves themselves and their masters to conceal their correct status. It must, however, be remembered that the state of slavery does not entail that character of servility which arises in the ordinary sense of the word. . . . Full liberty of conscience and unrestrained exercise of all forms of worship, which are consistent with public order and good morals, are permitted. The majority of the people are pagans and follow ancient customs. Fetishism is, therefore, the dominating religion amongst the population of Togoland. Adherents of the Christian religion, in many instances, still uphold the spirit of the Fetish influences. Polygamy is very prevalent. The individual will marry in church, but in the majority of instances insists upon having more than one wife. In these cases he is permitted to attend the church, but is barred from partaking of the Lord's Supper."

THE FLOODS OF PARIS.

WHILE the recent floods of Paris never reached the catastrophic level of January, 1910, they have caused considerable disorganisation in medical activities as in the general life of the city. In THE LANCET of Feb. 5th, 1910 (p. 390), we gave an account of the difficulties under which the hospital services and private medical practice had to be carried out, conditions which happily have not been repeated in the same degree of severity. As was the case 14 years ago, the first announcement of the effects of the inundation that has come to us through the Paris medical press was a short statement from the *Paris Médical* to the effect that their printing offices had been completely flooded. Consequently the first few issues of the *Paris Médical* for the present year will be delayed and the journal is meanwhile appearing in the form of a small supplement, printed elsewhere. We regret the misfortune which has befallen our contemporary, and trust that the damage it has sustained will be of a temporary nature only.

MEDICAL BOOKS AND JOURNALS FOR CENTRAL EUROPE.

A CORRESPONDENT has called our attention to the eager welcome which English medical books and journals receive in Hungary at the present time, where the poverty of the universities prevents the students from obtaining foreign technical works of any kind, although many of them speak and read English. France has already done something to make its literature accessible to the Hungarian people. We call attention again to the facilities for sending medical books and journals to Central Europe, afforded by the Universities' Library for Central Europe. This library works in coöperation with the Universities' Committee of the Imperial War Relief Fund and is now amalgamated with the literature department of the European Student Relief with headquarters at 16, Boulevard des Philosophes, Geneva, Switzerland, so that there is no duplication of effort. During the last year consignments of books have been sent to Austria, Czecho-Slovakia, Finland, Germany, Hungary, Poland, Roumania, and Russia, along with several sets of scientific journals including the *British Medical Journal*, *The Lancet*, *Nature*, and the *Journal of Pathology*. Free transport facilities are accorded to the Library by the Governments of Czecho-Slovakia, Finland, Germany, Poland, and Roumania, while consignments for Russia are transported free of charge by the Red Cross Society of Russia direct to Moscow, whence they are distributed by a representative of the European Student Relief. Medical books and journals may be sent to the Hon. Secretary of the Universities' Library at the London School of Economics, Houghton-street, W.C. 2, and earmarked for any particular destination.

We are also asked to state that the British Legation in Belgrade would be glad if any readers of *The Lancet*, who do not wish to keep their copies for binding and are willing to incur the postage, will send their copy, when read, to L'Association des Médecins Assistants des Hôpitaux, Hôpital Civil, Belgrade, Yugoslavia. Also that Prof. Richard Werner, director of the Samaritan House at Heidelberg (Inst. for Exper. Cancer Research, Vossstrasse 3), would gladly receive any recent books and pamphlets on the subject of cancer.

A TEST OF DEATH.

To the Editor of THE LANCET.

SIR,—Whether the popular belief that people have been accidentally buried alive is well-founded, one does not know; but the cynically disposed might accuse us of asking for it by our sanction of death certificates without a view of the body. Now that this reproach is happily to be removed, why not adopt some simple procedure to be certified as performed in every case of death, which, without harrowing the feelings of relatives, would establish scientifically the extinction of life?

The most perfect method could be determined by experts, but I find the following in the "Manuel Pratique de la Médication Hypodermique":—

R Fluorescine 1 gm.
Carbonate de Soude 1 gm.
Eau distillée q. s. pour 8 c.c.

For s. c. injection. In case of death there is no reaction. If death be only apparent, the integument turns green in a few minutes and the eyes intensely so.

Some increase in the fee would be amply repaid by the dissipation of all fear, groundless or otherwise, of one of the most horrible of possibilities.

I am, Sir, yours faithfully,
Jan. 13th, 1924. E. O'CONNOR.

*** The injection of fluorescin for this purpose is mentioned in many text-books. It is a qualitative test to determine whether circulation has ceased.—ED. L.

AVIATION AND DEFECTIVE SMELL.

AIRMEN have most of their senses and functions exhaustively examined already, but now comes Mr. A. L. M. Flamme, médecin aide-major de 1re classe[1], who thinks their sense of smell too should be investigated before they are admitted to training. There are smells which are danger signals to the pilot—e.g., burning petrol, showing risk of fire; petrol unchanged, which means a leak; burning oil, suggesting overheating of the cylinders and so engine failure; burning rubber, from failing insulation. All these connote serious risks, of which the sense of smell gives the first warning. Defective smell may imply trouble in the nerve centres, hysteria, previous injury to the head, rhinitis, or nasal obstruction, any one of which may diminish the pilot's efficiency. Defect however is not very common. Mr. Flamme examined the olfactory condition of 100 air craftsmen, and found only one who could not distinguish petrol, orange, or peppermint among the test solutions offered to him; this man failed to recognise that camphor in a 1–50,000 solution had any smell at all.

CANON MILLER.

A CORRESPONDENT asks us how the well-known General Hospital for South-East London came by its name, and the story happens to be interesting to ourselves. The original institution, which can be shown by actual records to have been in existence for 140 years, was called the Kent Dispensary, afterwards the "Royal" Kent Dispensary when it came under the patronage of Queen Victoria, the daughter of the Duke of Kent, but not until 100 years after its foundation was the dispensary turned into a hospital when certain wards were erected. This addition to the dispensary formed a memorial to Canon Miller, the rector of Greenwich, who had started a Hospital Sunday Fund at Birmingham during his incumbency there. With Dr. James Wakley, then Editor of THE LANCET, Canon Miller became the joint founder of the Metropolitan Hospital Sunday Fund, and the first meeting to organise that Fund was held in the editorial room of THE LANCET with Canon Miller in the chair (see THE LANCET Centenary Number, Oct. 6th, 1923, p. 739).

[1] Arch. de Méd. Milit., vol. lxxix., No. 3, p. 475.

An Address

(ABRIDGED)

ON

TUBERCULOSIS WORK IN ENGLAND.*

BY A. SALUSBURY MACNALTY, M.D. OXF.,

A MEDICAL OFFICER TO THE MINISTRY OF HEALTH: SECRETARY, TUBERCULOSIS COMMITTEE OF THE MEDICAL RESEARCH COUNCIL.

[AFTER a brief sketch of the pioneer work in tuberculosis effected by voluntary measures, work which was watched by the State with ever-increasing attention, Dr. MacNalty went on :—]

PROGRESSIVE INTEREST OF THE STATE IN TUBERCULOSIS.

Scientific Investigations and Royal Commissions.

The interest of the State in tuberculosis dates from the early days of health organisation in England. After Villemin in 1865 had made his classical communication on the transmissibility of tuberculosis before the Academy of Medicine in Paris, Sir John Simon, medical officer of the Privy Council, enlisted Sir John Burdon-Sanderson's aid in carrying out experiments which confirmed those of Villemin, and announced the findings in his reports to the Privy Council in 1867 and 1868. Also, both before and after Koch's discovery of the tubercle bacillus much research work was carried out by Klein and others on tuberculosis, with the assistance of scientific grants from the Local Government Board; these researches are embodied in special reports which well repay perusal. In this connexion I would refer to the investigation into soil dampness as a cause of tuberculosis made by the late Sir George Buchanan (Ninth and Tenth reports of the Medical Officer of the Privy Council, 1866 and 1867). It will be recalled that the results obtained in this inquiry were supported by the independent work of Bowditch in America.

A further stage in the deepening concern of the State with tuberculosis was seen in the appointment of the Departmental Committee in 1888 to consider, among other matters, the best method of dealing with tuberculosis with a view to checking the progress of the disease in cattle. About this time, also, experiments were being carried out on the subject of tuberculous meat under the direction of the Veterinary Department of the Privy Council; records of these experiments are to be found in the annual report of that department for the years 1890 and 1891. Brief allusion may be made also to the Royal Commission on the question of the effect, if any, of food derived from tuberculous animals on human health. The first of these was appointed by the Government in July, 1891, of which Lord Basing was chairman. On Lord Basing's death the Commission was reconstituted in 1894 under the chairmanship of Sir George Buchanan. It examined many witnesses, and organised searching researches on definite prearranged lines. It reported in 1895, the conclusions as to the effect of the consumption of tuberculous milk on human health being specially important. Obviously, more stringent administrative measures were demanded, and in 1896 another Royal Commission considered this aspect of the question. Its findings received legislative recognition in the Dairies, Cowsheds and Milkshops Order of 1899.

In 1901, at the Tuberculosis Congress held in London in that year, Prof. Koch announced in his historical address that he felt "justified in maintaining that human tuberculosis differs in important respects from bovine tuberculosis and cannot be transmitted to cattle." He added that repetition of the experiments which had caused him to make this assertion was desirable; in his opinion, the infection of man by bovine tuberculosis was so rare that for practical purposes it might be ignored. The Government felt the issue to be of such importance that on August 21st, 1901, a Royal Commission, with the late Sir Michael Foster as chairman, was appointed to inquire and report with respect to tuberculosis: (1) Whether the disease in animal and man is one and the same; (2) whether animals and man can be reciprocally infected with it; and (3) under what conditions, if at all, the transmission of the disease from animal to man takes place, and what are the circumstances, favourable or unfavourable, to such transmission. The Commission worked for ten years, and published a valuable series of reports which indicated that Koch's statement could not be accepted in its entirety, that human tubercle bacilli can infect cattle under experimental conditions, whilst bovine tubercle bacilli are responsible for a considerable proportion of human tuberculosis, especially among children.

In 1902 the Local Government Board instructed the late Dr. H. Timbrell Bulstrode, one of their medical inspectors, to visit the public phthisis sanatoria in this country and report upon the various aspects of the sanatorium question. The report, a bulky volume of 670 pages, was published in 1908. In addition to detailed descriptions of English sanatoria, it gives a comprehensive account of the state of scientific knowledge of tuberculosis at that time, and considers many aspects of the tuberculosis problem. The report should be more widely known and more widely read than has been its fate hitherto. In 1909 Sir Arthur Newsholme, as medical officer of the Local Government Board, wrote an important memorandum on Administrative Measures in Tuberculosis, in which much of the tuberculosis organisation now in force was distinctly foreshadowed.

Establishment of the School Medical Service.

The establishment of the School Medical Service by the Board of Education in 1907 had an important bearing on the prevention and treatment of tuberculosis in the child. First, many minor ailments and conditions favouring or predisposing to tuberculosis were recognised by school examination and removed by the treatment advised, given or enjoined on the parents to be procured; secondly, when a tuberculosis service came into being, opportunities for the treatment of tuberculous children under the schemes of local authorities were available through the coördinated work of the school medical officer and the tuberculosis officer. The labours of the School Medical Service—as the annual reports of the Chief Medical Officer of the Board of Education clearly indicate—have already secured a great reduction in the incidence of tuberculosis in children of school age.

Notification.

Scotland, always in the van of progress, regarded pulmonary tuberculosis as an infectious disease within the meaning of the Public Health (Scotland) Act, 1897. In England and Wales, in a few towns prior to 1908, all cases of pulmonary tuberculosis were notifiable under local Acts of Parliament, while in an appreciable number of urban and rural districts voluntary notification of cases of pulmonary tuberculosis was invited by the sanitary authority and secured in some proportion of the total cases of this disease.

In 1907 special encouragement was given by the Local Government Board to the voluntary notification of cases of pulmonary tuberculosis; in 1908 the Board issued the Public Health (Tuberculosis) Regulations, making notification compulsory for cases of pulmonary tuberculosis, who came under the care of Poor-law medical officers, either at home or in Poor-law institutions; these regulations were followed by the Public Health (Tuberculosis in Hospitals) Regulations, 1911, providing for the compulsory notification of cases of pulmonary tuberculosis receiving treatment in public institutions; the Public Health Regulations (Tuberculosis), 1911, made the notification of all cases of pulmonary tuberculosis compulsory. Finally, in 1912, the Board's Order, extending compulsory notification to cases of all forms of tuberculosis and

* Delivered before the Tuberculosis Society on Jan. 18th, 1924.

consolidating the three previous orders as to notification, came into force. Notifications are sent by the medical practitioner to the medical officer of health of the district in which the patient is residing. Under the regulations the medical officer of health is made responsible for the action needed to trace sources of infection, or to remove conditions favourable to infection. This responsibility rests with him whatever may be the local system of organisation as to tuberculosis.

The National Insurance Act, 1911.

The resources for attacking the problem of tuberculosis were strongly reinforced by the passing of the National Insurance Act, 1911. This Act, which applied throughout Great Britain, dealt, as regards tuberculosis in insured persons, with (*a*) treatment, (*b*) erection of sanatoria, and other institutions; (*c*) research; and (*d*) education. It was open to the obvious criticism that only the insured persons in the community received specialised treatment for tuberculosis, and that the measure was not one of general public health.

The Departmental Committee on Tuberculosis.

The Government were naturally aware of this criticism and lost no time in meeting it. In 1912 the Lords Commissioners of His Majesty's Treasury appointed a Departmental Committee, under the chairmanship of Mr. (now Lord) Astor, to report at an early date upon the consideration of general policy in respect of the problem of tuberculosis in the United Kingdom. The Committee were also to consider the problem in its preventive, curative, and other aspects, and to advise the Government and local bodies as to the making or aiding of provision for the treatment of tuberculosis in sanatoria or other institutions or otherwise. The Committee issued two reports, an interim report in 1912 and a final report in 1913. In these reports the whole field of tuberculosis was surveyed, the available machinery was considered, and practical advice was given as to the organisation of schemes for the prevention and treatment of tuberculosis under the National Insurance Act.

Two important findings of this Committee were: (1) that any scheme which is to form a basis for the control of tuberculosis should be available for the whole community; and (2) that the organisation of schemes through the country can best be carried out if undertaken by local authorities.

TUBERCULOSIS SCHEMES FOR ENGLAND UNDER THE LOCAL GOVERNMENT BOARD.

In their circular of May 14th, 1912, the Local Government Board expressed their general agreement with the findings of the Departmental Committee on Tuberculosis, as set out in the interim report, and urged all county councils and county borough councils in England to formulate a scheme which should provide for the treatment of cases of tuberculosis within their area. There was a general consensus of opinion—already expressed, as we have seen, by the Departmental Committee—that complete schemes, not limited to insured persons, but available for the entire population, must be undertaken for effective control over tuberculosis. For these complete schemes funds other than those available under the National Insurance Act were required. In their circular letter of Dec. 6th, 1912, the Local Government Board stated that the Government were prepared annually to provide a sum of money equal to half the estimated cost of treating non-insured persons, including dependents of insured persons, under any scheme approved by the Local Government Board. The grant is often called "The Hobhouse Grant," as it was first announced in a letter from the Chancellor of the Exchequer to Mr. Henry Hobhouse, Chairman of the County Councils Association.

To summarise the position. The schemes for the treatment of tuberculosis, applying to the whole population, insured and uninsured, were carried out by county and county borough councils. The Local Government Board acted as a sanctioning or advisory body, and also as a subsidising body. A similar function is exercised by the Ministry of Health at the present time. The Board also gave grants to local authorities towards the establishment of institutions for the treatment of tuberculosis out of a sum of £1,500,000 which was set aside under the Finance Act, 1911, for this purpose. The scale of capital grants was: dispensaries, four-fifths of the cost, but not exceeding £240; sanatoria and hospitals, three-fifths of the cost, but not exceeding £90 a bed. The annual cost of a tuberculosis scheme was defrayed in the first instance by the local authority. There were receipts from the Insurance Committee to be taken into consideration, and half the deficit was paid by the Local Government Board. The money for this purpose was voted annually by Parliament. The remaining half of the deficit was borne by the local authority out of rates.

It is a tribute to public enterprise that in the majority of instances agreement and coördination were effected between the local authority and the Insurance Committee, but the complexity of the machinery available for this purpose undoubtedly delayed the submission of schemes for the treatment of tuberculosis. The passing of the Ministry of Health Act in 1919, which devolved the provision of sanatorium treatment upon local authorities, was generally welcomed; it put an end to the artificial distinction between the insured and the uninsured tuberculous patient.

The Tuberculosis Scheme.

The complete scheme for the prevention, detection, and treatment of tuberculosis adopted by the Local Government Board was virtually that recommended by the Departmental Committee on Tuberculosis. It was based on the establishment and equipment of two units related to the general public health and medical duties carried on by the medical officers of health working in harmony with the general practitioners. It was laid down by the Local Government Board (circular letter of Dec. 6th, 1912) that the organisation of schemes must be undertaken as part of the public health administration of the area to which they relate with the medical officer of health as the chief administrative and organising officer. The advantages of coördinating the preventive and therapeutic sides of tuberculosis under one administrative head are obvious, and are now generally recognised.

The first unit of the scheme consists of the tuberculosis dispensary or an equivalent staff. The second unit consists of the sanatoria, hospitals, &c., in which institutional treatment is given. The aims of the scheme were thus stated by the Departmental Committee:—

> The Committee are of opinion that the tuberculosis dispensary should be the common centre for the diagnosis and for the organisation of treatment of tuberculosis in each area at which the various bodies and persons connected with the campaign against tuberculosis will be brought together. The aim should be that no single case of tuberculosis should be uncared for in the community, and that whatever services the scheme provides should be available for all cases of the disease. Next to the tuberculosis dispensary should stand the second unit, consisting of a system of sanatoria, hospitals, farm colonies, open-air schools, &c. The tuberculosis dispensary should be linked up to these institutions, for which it will act as a clearing house.

In practice, therefore, a complete scheme approved by the Local Government Board would provide for: (1) the medical officer of health of a county council or county borough as chief administrative officer; (2) tuberculosis medical officers appointed by the local authorities; (3) dispensaries (including a system of health visiting); (4) sanatoria for early cases (5) hospitals for intermediate and advanced cases. In accordance with Section 16 (1) (*b*) of the National Insurance Act, insured persons suffering from tuberculosis might be placed upon domiciliary treatment—that is, they could be treated in their own homes by the panel medical practitioner.

By July 18th, 1914, appreciable progress had been made by local authorities in preparing complete

schemes; 192 clinical tuberculosis officers had been appointed in England. Dispensary premises were established for the most part by the adaptation of an ordinary dwelling-house rented by the local authority. The chief difficulty lay in the provision of residential institutional accommodation. All institutions of repute for the treatment of tuberculosis obtained the temporary approval of the Local Government Board at the outset of the campaign; but the demand for beds far exceeded the supply, and it was soon evident that local authorities either independently or in combination must provide their own residential institutions. Accommodation for early intermediate and advanced cases was sadly lacking; also, as regards provision of beds for children, treatment of surgical tuberculosis, and after-care work, little had been done by 1914. Yet much of the field had been surveyed, plans had been prepared or were in course of preparation, and already the machine of organisation was moving steadily if slowly when its progress was arrested by the outbreak of the war.

Tuberculosis Administration During the War.

The war adversely affected the national campaign against tuberculosis in various ways. Certain county medical officers of health and many tuberculosis medical officers joined the Naval or Army Medical Services. The medical officers who were entrusted with their work could do little more than "carry on" under the existing methods of organisation. War conditions rendered it difficult to keep even a minimum service in being, and still more difficult to make any progress with the development of official schemes. It was necessary to impose restrictions on building except for urgent war work, and in 1915 an embargo was laid on the construction of new sanatoria. These circumstances further enhanced the shortage of residential accommodation for tuberculosis in England, never, as has been mentioned, adequate for the pre-war population, and to add to the difficulties of the position in the closing years of the war there came an overwhelming demand for beds in sanatoria for ex-Service men.

Tuberculosis in the Ex-Service Man.

That military service would heighten the incidence of tuberculosis in the adult male population was foreseen as early as 1915. Unfortunately, owing to the military exigencies of the time, all available energy had to be concentrated on prosecuting the war, or more adequate provision would certainly have been made beforehand. Arrangements were made for sailors and soldiers suffering from tuberculosis to be discharged from the colours and treated under the general tuberculosis scheme; they were to be admitted through insurance committees to approved sanatoria or hospitals, and it was stipulated that they should be given priority over civilians on the waiting lists of these institutions. The cost was borne partly from insurance funds, and partly by the Ministry of Pensions. Subsequently the Ministry of Pensions made themselves responsible for the entire cost of treatment of the tuberculous ex-Service man. This demand for sanatoria beds was associated with appeals for additional residential accommodation for civilians (especially for women). Many local authorities took action, stimulated by a circular on the subject from the Local Government Board, and a considerable number of additional beds were provided. In April, 1918, the number of beds available in voluntary institutions and in sanatoria and hospitals owned by local authorities was 12,441. On April 1st, 1919, the number was 13,523, and on July 1st, 1919, the number was 14,014. Arrangements were also made for the systematic observation of the health of the tuberculous ex-soldier. Periodic visits to the home were made by the health visitor, and the tuberculosis officer, in addition to visiting the home of the patient when necessary, supervised the work of the health visitor and acted on her report. The home visitations were intended to secure as far as practicable that the patient's surroundings, mode of life, and so forth should be as satisfactory as possible, and that prompt arrangements should be made to provide treatment in a residential institution whenever this was considered desirable by the tuberculosis officer.

The Ministry of Health.

The establishment of the Ministry of Health in 1919 had an important influence upon the prevention and treatment of tuberculosis. The new Ministry became heir to the responsibilities and functions previously exercised by the Local Government Board and by the Insurance Commissioners; the Ministry was also placed in close accord with the medical services of the Board of Education, the Chief Medical Officer, Sir George Newman, retaining his previous appointment as Chief Medical Officer of the Board of Education. Again, in the establishment of the Ministry a great stride was taken forward in the coördination of the public health services. For the first time a special medical department of the Ministry solely concerned with tuberculosis was set up, of which Dr. F. J. H. Coutts is the head. This department through the organisation in force is in close association with a number of branches of public medicine and Poor-law administration, formerly in different water-tight departments in Whitehall and now assembled under the Ministry. Tuberculosis is a complex problem, and its study demands the aid and coördination of the various component parts of public health and medicine. Lastly, with the advent of the Ministry of Health central control was at once made more unified and comprehensive in regard to tuberculosis schemes.

THE INTER-DEPARTMENTAL COMMITTEE ON TUBERCULOSIS (SANATORIA FOR SOLDIERS).

This Committee was appointed conjointly by the Minister of Health and the Minister of Pensions in April, 1919, "to consider and report upon the immediate practical steps which should be taken for the provision of residential treatment for discharged soldiers and sailors suffering from tuberculosis, and for their reintroduction into employment, especially on the land." The Committee examined and received memoranda from tuberculosis officers, superintendents of sanatoria, representatives of insurance committees, representatives of public health authorities, persons engaged in the management of tuberculosis colonies, and representatives of discharged service men, and reported in August, 1919.[1] The total number of tuberculous ex-Service men, whether invalided out of the services on account of tuberculosis or afterwards found to be suffering from tuberculosis attributable to or aggravated by conditions of service, amounted to approximately 35,000. Of this number the Committee found that 22,000 had received or were at that time receiving residential treatment which had often been for far too short a period. There were some 4000 men then undergoing residential treatment. The Committee reported favourably upon the establishment of training colonies and of permanent village settlements for ex-Service men. The remaining recommendations dealt with the need for further accommodation for advanced cases, convalescent homes for tuberculous patients (admittedly an institution for a somewhat limited class of case), the reintroduction of tuberculous men into employment, and overseas settlement. The report recognised that the problem of the ex-Service man was equally the problem of the tuberculous civilian. The need for national economy has prevented the financial recommendations of this Committee from being carried out in their entirety. Vocational training sections have been provided at certain sanatoria at the cost of the Government for ex-Service men. The maximum number of places available at one stage was 510. The figures for England at the end of December, 1923, showed that 935 men had been or were undergoing courses of instruction at these centres, and that 71 remained to be instructed. The scheme has now been extended to Wales, Scotland, and Ireland, and ex-Service men for

[1] Report of the Inter-Departmental Committee, London: H.M. Stationery Office. 1919. (Cmd. 317.) 6*d*.

training are being admitted from these countries to the training sections. The scheme will come to an end on Dec. 31st, 1924.

It is interesting to note that the Central Fund for the Industrial Welfare of Tuberculous Persons has embarked upon an experimental scheme for the settlement of a group of men who have received training, but who otherwise would not be able to secure employment owing to their slow rate of production. These men live in their own homes in London and attend at a workshop daily. The ideal aimed at is to enable them ultimately to work at home on orders supplied to them by the Central Trading Organisation; they will then be able to live in the smaller county towns or distant suburbs under favourable conditions; some of them may ultimately develop markets of their own. The scheme may be regarded as an attempt at "graduated settlement."

GROWTH OF TUBERCULOSIS SCHEMES.

At this stage one may pause to note the growth to which tuberculosis schemes have attained in England. A tuberculosis service is being carried out in 442 dispensaries by 349 tuberculosis officers. The number, character, and accommodation of the resdential institutions approved by the Ministry (as at March 31st, 1923) are shown in this table:—

Residential Institutions.

Sanatoria and hospitals.	Number of institutions provided by—		Number of beds provided by—	
	Local authorities.	Voluntary bodies.	Local authorities.	Voluntary bodies.
1. Sanatoria (including consumption hospitals) ..	129	69	8,221	5,075
2. Isolation hospitals (including small-pox hospitals) having beds for tuberculosis	54	—	2,287	—
3. General hospitals	1	127	20	473
4. Children's institutions ..	17	44	998	2,312
	201	240	11,52	7,860
	441		19,386	

MEDICAL PROGRESS IN TUBERCULOSIS.

The tuberculosis scheme, as set out by the State, has many advantages. It is not a rigid scheme, for every local authority within reasonable limits can formulate the scheme most suited for its individual needs; prevention and treatment are linked together; the general practitioner is an integral part of the scheme. The knowledge of an expert consultant in tuberculosis is at the service of every individual suspected to be suffering from or suffering from tuberculosis in the country; in training and industrial colonies and in after-care supervision some, though perhaps not yet sufficient, attention is paid to the important fact that tuberculosis has a social as well as a medical aspect. Furthermore, the scheme is elastic; it should incorporate every advance in treatment of the disease, and such advances have been numerous in recent years. Let me briefly refer to the most important of these advances:—

(1) *Medical Research.*—Under the auspices of the Medical Research Council research work on tuberculosis is established on comprehensive lines, and is closely coördinated with the work of the Ministry of Health. There is a General Committee, a Bacteriological Committee, and a Tuberculin Committee. The latter has been engaged for the past two years in investigating the problem of tuberculin testing in cattle, an inquiry which has an important bearing not only on the purity of the milk-supply, but also bears indirectly on the incidence of bovine tuberculosis in man. The work of other committees of the Council is partly concerned with tuberculosis. Thus, the Industrial Health Statistics Committee pays attention to tuberculosis in industrial occupations; the Light Committee deals with heliotherapy in the treatment of tuberculosis.

(2) *Treatment of Surgical Tuberculosis.*—The treatment of surgical tuberculosis has been revolutionised in our own time by the work of Sir Robert Jones, Sir Henry Gauvain, Mr. G. R. Girdlestone, and others. It is not too much to say that in 20 years' time permanent crippling from tuberculosis will be regarded as a serious reflection on those concerned with the case. As yet, however, the provision for surgical tuberculosis is much too meagre.

(3) *Heliotherapy.*—The work of Rollier at Leysin, the Finsen light, the electric-arc light treatment of Reyn, of Copenhagen, now introduced by Dr. Sequeira at the London Hospital for the treatment of lupus, are all new methods of treatment which are at our disposal, and which are practised in this country.

(4) *Artificial Pneumothorax.*—For selected cases of pulmonary tuberculosis this method of treatment may arrest the disease, or at all events prolong life, and should be practised more frequently than at present. I cannot speak with such eulogy of thoracoplasty, though favourable results are reported in a minority of cases.

(5) *X Rays.*—X rays are being increasingly used in the diagnosis of cases of tuberculosis. They are essential in treatment by artificial pneumothorax, and of value in the differential diagnosis of obscure pulmonary conditions. In treatment for lupus or for tuberculous glands the results are disappointing, and the risk of carcinoma supervening in scarred tissue after prolonged treatment must be remembered.

(6) *Sera and Vaccines.*—Ever since the announcement by Koch of the preparation of tuberculin, hopes have been aroused that the discovery of an effective serum or vaccine might solve the problem of the treatment of tuberculosis. There is undoubted evidence that tuberculin in certain cases did promote arrest of the disease, but the risks undoubtedly outweigh the precarious advantages. Good results seem to have been obtained by the late Dr. Arthur Latham and by Dr. E. H. Colbeck in cases of pulmonary tuberculosis treated by Mr. H. Spahlinger's complete serum and vaccine. Unfortunately, the supply has been exhausted, and hitherto Mr. Spahlinger has not been in a position to furnish the Ministry of Health with supplies of his preparations for the purpose of a scientific clinical test. More recently still Prof. G. Dreyer has prepared "diaplyte" (*B. tuberculosis*) vaccine. This vaccine is being tested under the auspices of the Medical Research Council at several centres in Great Britain. It is too early to express an opinion as to its value in treatment, but certain of the results so far obtained are encouraging.

My purpose in alluding to medical progress in tuberculosis is to emphasise that the State is kept duly cognisant of the advances made, and is prepared to assist local authorities in putting them at the service of the community, subject, of course, to necessary financial restrictions, as soon as they are justified of medical science.

CARE COMMITTEES.

One important recommendation of the Inter-Departmental Committee on tuberculosis was that care committees should be established as an integral part of tuberculosis schemes. Unfortunately, this recommendation has not been carried out in a large number of areas. Tuberculosis is a disease bred of poverty, and in turn causing poverty. The vicious circle can be broken by appropriate medical treatment on the one hand, and by suitable sociological action on the other. The development of care work is greatly to be desired, as Dr. F. J. H. Coutts pointed out in his paper at the annual meeting of the National Association for the Prevention of Tuberculosis in July, 1923. We all recognise that the difficulties are great—e.g., dearth of skilled workers, the complex nature of the problem, and lack of local social organisations. So far as ex-Service men are concerned the British Red Cross Emergency Help Committee and the United Services Fund give valuable help; in all areas it is

desirable that their work should be coördinated with that of care committees for the tuberculous.

TRAINING COLONIES AND VILLAGE SETTLEMENTS.

This brings me to the subject of the industrial colony and village settlement, one of the most important advances in the treatment of tuberculosis, and one which the State has encouraged by financial subsidies and support. From what has been said, it will be realised that treatment of the tuberculous patient in a sanatorium under the national scheme has merely had a limited period of effective trial and in many areas only since the termination of the war. Sanatorium treatment cannot and should not be regarded as a failure. When suitable cases were selected, the method often affected partial or complete arrest of the disease. Where failure occurred it was mainly though not exclusively in the sequel of sanatorium treatment. The sanatorium patient with a recently healed lesion often went back to a pernicious environment, or was subject to the stresses of competition with healthy labour. But his is a damaged life; he cannot compete in the open labour market; his physique will not permit him to stand the strain of modern industrial life. His earning capacity declines; if the after-care committee is non-existent in his area or unable to find him a light occupation in which he can obtain a living wage he descends in the economic scale.

This sociological side of tuberculosis had engaged attention at an early stage of sanatorium treatment in this country. In some sanatoria efforts were made to prolong the period of treatment by finding suitable work for a limited number of ex-patients for a time at the institution, and by affording some degree of training in suitable occupations. Colonies represent the development of this work. It is admitted that the ideal is to treat and train the consumptive at a residential institution, and afterwards to establish him in a village settlement with his wife and family, where he can carry out his work under medical supervision and under the healthiest possible conditions. One school of thought affirms that this ideal can be attained by restricting the provision of training and occupation for consumptives to established residential institutions. It is held, then, that economic pressure will drive the consumptive worker and his family into the village settlement and industrial centre. Financial exigencies alone, however, seem to forbid the establishment of enough industrial colonies and village settlements to provide for all the consumptive workers in the country. The other school considers it desirable to make provision for industrial training and employment centres in large urban districts, such as the centre in Leeds. The patients in such centres will work on similar lines to those pursued in residential training centres; their work will be graded, they will be under the medical supervision of the tuberculosis officer, and receive financial assistance for themselves and their dependents by their labour being subsidised as in the industrial colony. In the event of a recrudescence of tuberculosis or of a slight breakdown in health they will be admitted to a local hospital for prompt treatment.

Experiments of this character are being watched by the Ministry of Health with the closest attention. They strive to offer a solution to the combined medical and sociological problems of tuberculosis. The answer may come by various roads; when it is attained local authorities should not be slow to recognise it as the crown of a tuberculosis scheme.

CONCLUSION.

In this brief sketch of tuberculosis work in England I have endeavoured to trace the steps by which isolated and voluntary measures culminated in the intervention of the State with a comprehensive and coördinated plan of organisation.

Such a scheme is of necessity costly. The total public expenditure by the Exchequer and local authorities upon tuberculosis schemes is more than 2½ millions annually.

As to the value and effect of general public health measures and special anti-tuberculosis work on the declining mortality-rate from tuberculosis we may consult the mass of valuable statistical information on the subject which is given in the supplement to the Seventy-fifth Annual Report of the Registrar-General of Births, Deaths, and Marriages in England and Wales, Part III., Registration Summary Tables (1901–10), 1919 (Cd. 8002): "The deaths assigned to tuberculous affections in the aggregate for the period 1901–10 numbered 565,161, being fewer by 50,845 than the number in the preceding decennium. Corrected for estimated increase of population the difference becomes 121,941. The statement of the number of lives saved is further increased when allowance is made for the fact that the constitution of the population in 1901–10 was more favourable to tubercle mortality than was that of the population in 1891–1900 The standardised death-rate in 1901–10 was 1646 per million living, showing a reduction of 18·6 per cent. from the corresponding rate in the preceding decennium. On this basis the reduction in the number of deaths from what might have been expected if no further fall in mortality had occurred amounts to 128,758."

During the interval of 50 years preceding 1910 mortality from tuberculosis has been nearly halved among males and more than halved among females. The period, 1860–1910, of lowered mortality from tuberculosis is associated with a certain degree of institutional segregation of the consumptive, and with education of the consumptive in measures of precaution against dissemination of the disease. The foundation-stones of a campaign against tuberculosis were being laid, and measures of this kind had a certain share at all events in effecting a reduction in incidence of the disease. Again, the same period embraces wide measures of public health and social reform. Better sanitation, better housing, higher wages, more abundant food supply, cheaper bread, better industrial conditions, and coördinated public health measures prevailed. To this realisation of the responsibilities of the community towards improving the standard of health in general, and towards the care of tuberculous persons, may fairly be ascribed the remarkable fall in the death-rate witnessed in the latter part of the nineteenth and first decade of the present century.

The standardised death-rates per million living from 1910 onwards, with the exception of the transient rise in tuberculosis mortality due to war conditions in the years 1914 to 1918, show a further progressive diminution in the mortality from tuberculosis of the respiratory system, as demonstrated in the following table:—

Year.	Males.	Females.	Persons	Year.	Males.	Females.	Persons
1910	1145	841	988	1917	1860	949	1384
1911	1206	883	1035	1918	2052	1037	1522
1912	1169	837	993	1919	1097	824	953
1913	1133	807	961	1920	966	733	843
1914	1164	839	992	1921	965	754	854
1915	1452	887	1155	1922	982	741	855
1916	1600	893	1230				

Let us glance again at the decline in respiratory tuberculosis. In 1847 the death-rate was 3189 per million, and in 1922 it was 855. In the Registrar-General's Report (1920), Dr. Stevenson, speaking of the mortality of tuberculosis, says:—

> "In the past two years this rate has fallen more rapidly than in any previous similar period of which we have record . . . . It is to this continued increase in the relative rate of fall that we must look for evidence of the effect of the anti-tuberculosis measures of recent years."

We may not see the day when tuberculosis is as rare in England as leprosy, but we can look forward to its ultimate attainment with some degree of hope. And, as Robert Louis Stevenson tells us in "Virginibus Puerisque": "To travel hopefully is a better thing than to arrive."

THE "SELF-DEFENSIVE REACTION" IN THE TREATMENT OF MALARIA.

BY IVAN I. MANOUKHIN, M.D.

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THE therapeutics of infectious disease have been based, up to the present time, on the three following principles: (1) Active immunisation, introduced by Pasteur; (2) passive immunisation, first elaborated by Behring, Kitasato, Wernicke (Koch's laboratory), and Roux (Pasteur's laboratory); and (3) hæmotherapy, elaborated by Ehrlich.

The three first fundamental principles were shown by practice to be insufficient for the treatment of infectious diseases, for the following reasons: (*a*) active immunisation gives brilliant results when used chiefly for preventive purposes, as intended by Pasteur; (*b*) passive immunisation gives results only in toxic infections, its use being greatly limited by the phenomena of serum anaphylaxis; (*c*) hæmotherapy cannot be applied with certainty to most infectious diseases, especially to their bacterial forms. The necessity of finding new methods whereby the therapeutics of infectious diseases may be rescued from this unprofitable situation has therefore become urgent.

Among these methods is my own artificial stimulation of the self-defensive power of the organism, which reacts according to laws formulated by myself.[1 2] To this new principle of the therapeutics of infectious diseases I gave the name of the phenomenon upon which it is based—i.e., the "self-defensive struggle." Founded on the general law which governs the struggle of the organism against infection, this method exercises a curative action in widely different infectious diseases. Investigations carried out with the collaboration of Drs. S. Maximadji, W. Malichewsky, M. Markewitch, A. Mouratova-Koudria, Y. Sokolova, and W. Warawka have confirmed my statements concerning the value of the method; the latter curtails the evolution of lobar pneumonia and of recurrent typhus, shortens the duration of catarrhal pneumonia, and is applied with considerable success in the treatment of tuberculosis in its different localisations.[3 4 5 6 7 8 9 10] Similar success is obtained in cases of typhoid, dysentery, tetanus, &c.; these last-named infections necessitated further development of my method.[5] Consequently the "self-defensive" treatment of malaria, as I have already shown,[4 6] is only a particular instance of the application of the method.

History of the Treatment.

When medicine was enriched by the theory of the organs of internal secretion, owing to the work of Brown-Séquard and Pavlov, it became evident that the activity of the chief physiological apparatus is determined by the secretion of internal organs constituting it. Consequently, the study of the conjugated action of the different hæmopoietic organs during the self-defensive struggle of the organism against infection should be regarded in the same light.

This orientation permitted me to discover the specific ferments which produce in the blood the sequence of the phenomena comprising the self-defensive struggle of the leucocytes. The phenomena of the leucocytic reaction were definitively described by the pupils of A. Schmidt: Hoffmann,[11] Samson-Himmelstierna,[12] Heyl,[13] Groth,[14] and later on by Tchistovitch,[15] S. S. Botkine,[16 17] Rieder,[18] Löwit,[19] Wassermann,[20] and others. The hæmoleucocytic reaction consists of a succession of two processes of hypoleucocytosis, primary and secondary, separated by a process of hyperleucocytosis.[21]

Leucocytolysins and Antileucocytolysins.—My experiments showed me that the appearance of primary and secondary hypoleucocytosis in human or animal blood infected by pathogenic agents, is subordinated to the presence in the blood of ferments which condition the massive destruction of leucocytes—i.e., which constitute the phenomenon of "leucocytolysis." These ferments I have called "leucocytolysins"; they are elaborated in the spleen. The hyperleucocytosis is determined by the presence in the blood of ferments checking the destruction of white blood corpuscles, which I have called "antileucocytolysins"[1 22 23]; the latter are elaborated in the liver.[24 25 26 2]

Rôle of the Spleen.—The spleen directs all the phenomena of the self-defensive struggle of the organism. The leucocytolysins do not confine themselves to the production of hypoleucocytosis; they also stimulate the leucopoietic activity of bone-marrow as well as the antileucocytolytic activity of the liver,[2] which phenomena make hyperleucocytosis possible.

Means of Stimulation of Leucocytolytic Function of the Spleen.—When I had determined the function of ferments necessary to the hæmoleucocytolytic reaction the next problem was to find a means of artificial activation of the leucocytolytic function of spleen cells. I was able to fix the precise dose of X rays, the conditions of obtaining them, and the frequency of application, in order to get a stimulating effect only.[1 24 4 2 6] Experiments with a strictly determined dose of X rays applied to the spleen of animals gave me a profound conviction that the phenomena of stimulated self-defensive artificial reaction produced in the blood of animals an accumulation of alexine, hæmolysins, agglutinins, bacteriolysins, and opsonins.[27 2]

Treatment by Radiation of the Spleen of Animals Infected with Different Pathogenic Agents.—Under the influence of the treatment by "the self-defensive struggle" animals are cured of different infections transmitted to them. Thus it was observed in (*a*) Tuberculosis of monkeys and guinea-pigs.[2] (*b*) pneumonia of dogs, infected by the diplococcus of Fränkel, and (*c*) "Spanish" influenza of guinea-pigs infected with the *Diplobacillus morbi hispanici*, a diplococcus discovered by me in collaboration with Y. Sokolova.[29]

Leucocytolysis as Basis of Self-defensive Reaction

The constant and durable results obtained in all my experiments concerning the struggle of the organism against infection and against its toxins permitted me in 1911 to formulate the following assertion: "Biology, with all the sciences which accompany it, and medicine in particular, must henceforward modify the theory of phagocytosis by the theory of leucocytolysis and phagocytosis."[1] The immense amount of material which I have since observed now permits me to extend my generalisation as follows: "Biology must henceforward recognise that the premier rôle in the defensive struggle of the organism against infection and its toxins is that of leucocytolysis, and no longer that of phagocytosis. Phagocytosis never comes into play unless the microbes are greatly weakened and their toxins neutralised by the preceding phenomenon of leucocytolysis." The discovery of this law provided me with a link between the conception of the important rôle of the leucocytes in the leucocytic defensive reaction, and the humoral theories of immunity.

The Self-Defensive Struggle in Malaria.

I shall try to prove that the above biological law appears at the basis of the self-defensive struggle of the organism against Laveran's parasite, which constitutes a particular instance of the general self-defensive reaction. The characteristics of the leucocytic formula in malaria are as follows:—

1. *Hypoleucocytosis* (Kelsch,[30] Halla,[31] Pée,[32] Bastianelli,[33] Vincent,[34] &c.).—This process takes place chiefly at the cost of polynuclears (their number according to Bezançon and Labbé,[35] falling to 40 and even to 20 per cent.), and is observed at the period of apyrexia; its minimum (up to 3000 and even 1000) appears at the beginning of the chill which accompanies the attack—that is to say, at the moment when "the hæmatozoars, having reached their maximum development, are about to reproduce themselves by

endogenic and asexual means and present themselves in the form of 'corps en rosace'" (Billet [36]).

2. *Hyperleucocytosis* (Führmann,[37] Boeckmann,[38] Vincent,[34] &c.).—This also takes place at the expense of polynuclears (Türck,[39] Poech,[40] &c.). It begins during the chill period, immediately after the most characteristic phase of hypoleucocytosis, and reaches its maximum at the moment when "the hæmatozoars spread in the serum in the form of small amœboid bodies, in order to infect new corpuscles" (Billet [36]). According to Billet it reaches 12–20 thousand (exceptionally 25–30 thousand), continues during the whole period of fever, and ceases with the appearance of sweating, being then transformed into hypoleucocytosis, always shortly before the fall of the temperature. In that way the general characteristics of the leucocytic curve in malaria are the same as those found in all the cases of self-defence of the organism against infection; that is to say, the curve consists of alternative periods of hypo- and hyper-leucocytolysis. The only particular characteristic of the evolution of self-defence against Laveran's parasite is found in the prolongation of the periods of hypoleucocytosis at the cost of the periods of hyperleucocytosis; the latter, according to Vincent and Rieux,[41] are sustained for a few moments only in malaria.

3. *Lymphocytosis* (Bastianelli,[33] Vincent,[34] Türck,[39] Billet,[36] &c.) and *Mononucleosis* (Billet,[36] Stephen and Christophers,[42] Rogers,[43] Poech,[40] Delany,[44] &c.).—The lymphocytosis is the result of the massive diminution of the number of polynuclears; that is why, according to Vincent and Rieux,[41] the lymphocytosis particularly "characterises the interval between pyretic attacks," during which it often reaches 40, 50, and even 70 per cent. The mononucleosis is provoked not only by the diminution of polynuclears, but also by the checking action of thyroid secretion.[25] This is the reason why mononucleosis becomes a characteristic of the blood in exophthalmic goitre. With malaria, having another origin than of lymphocytosis, it is observed during the febrile periods (5–10 per cent., according to Billet [36]), as well as during the apyrexial periods which separate them (according to Billet it then reaches 25–30 per cent.).

4. *"Forms of Dissolution" of the White Corpuscles.*—These forms were first described in malaria by Petroff,[45] who commented on their high percentage from 22–33 per cent. in different forms of malaria). (This fact is of very great importance, considering that it shows us that the hæmoreaction of the human organism in its struggle with the malarial parasite is characterised by an enormous destruction of white corpuscles." Nevertheless, it must not be forgotten that the presence of the "forms of dissolution," according to the experiences of their discoverer himself (E. S. Botkine [46]), is by no means a certain indication of a disaggregation of leucocytes taking place in the blood at the moment. This question can only be solved by determination of the presence of leucocytolysins in the blood.

5. *Leucocytolysins and Antileucocytolysins.*—Since 1906 I have experimented with the leucocytolytic properties of the blood of patients suffering from different forms of malaria. These patients were under a treatment at the therapeutic clinic of the Medical Military Academy of Petrograd, at Mary's Hospital at Petrograd, and, during the war, at a Red Cross hospital under my direction, which hospital was reserved for soldiers evacuated from the front with infectious diseases. Having experimented on the blood of 47 patients, I succeeded in showing that the hypoleucocytosis in malaria really took place exclusively because of massive destruction of leucocytes in the blood. Consequently the hæmoreaction in malaria is subordinated to the general law of all infections, the law of the self-defensive reaction, based on leucocytolysis.

My observations have thus shown that the presence of leucocytolysins can be brought to light in malaria at the moment of the thermometric fall, in the period of apyrexia, during the period of hypoleucocytosis, primary and secondary; but their maximum accumulation can be established immediately before the rise of temperature, and immediately after its fall. At the moment of hyperleucocytosis in the blood, the presence of antileucocytolysins is observed; the substitution of the antileucocytolysins by the leucocytolysins always slightly precedes the beginning of the fall in temperature (see charts).

6. *Eosinophils.*—Authors (beginning as far back as Grawitz [47]) differ concerning the variations of the number of eosinophils and their significance in malaria. Of late, however, most authors agree that the quantity of eosinophils in malaria is infinitesimal, that frequently they are not to be found at all (because of the intense leucocytolysis), and that their percentage augments only when the patient is on his way to recovery; I found the same phenomena in all my patients.

7. *Irritation Cells of Türck.*—These, according to Vincent and Rieux,[41] are often to be observed in malaria in the period of apyrexia and generally in the proportion of 1 and 2 per 100 leucocytes.

8. *Myelocytes.*—In malaria a slight myelocytic reaction (Rogers,[48] &c.) is frequently remarked. According to S. S. Botkine,[49] the apparition of myelocytes is a sign of exhaustion of hæmopoietic organs, which furnish a great number of new cells in order to replace the great destruction of leucocytes continually taking place in the blood.

We have thus come to the following conception: All the particular characteristics of hæmoreaction in malaria—that is to say, hypoleucocytosis, diminution of polynuclears, lymphocytosis, "forms of dissolution," partial mononucleosis, diminution of eosinophils, and a slight myelocytic reaction—are produced by the leucocytolysis; in other words, leucocytolysis is itself the cause of the self-defensive reaction of the organism in its struggle with Laveran's parasite.

The Rôle of the Spleen in Malaria: Method of Self-defensive Treatment.

The increased production of leucocytolysins necessary to the leucocytolysis is regularly accompanied in malaria by a marked enlargement of the spleen volume. "The diminution of white corpuscles and the swelling of the spleen," as Kelsch [30] has written, "are two parallel facts in malaria." The enlargement of the spleen undoubtedly shows that the activity of this organ is insufficient for the requirements of the organism as a whole when the latter is attacked by Laveran's parasite. The radical treatment of malaria should realise an artificial activation of the function of the spleen cell, until that function fulfils the needs of the organism with regard to leucocytolysis.

The aim of my method of self-defensive treatment being the activation of the leucocytolytic rôle of the spleen, in malaria I use a dose of X rays equal to 1 h. (Holzknecht unit), as measured by the Sabouraud and Noiré radiometer; the rays are filtered through 1 mm. of aluminium, and the Holzknecht scale is used. I employ this dose for five minutes at 1 milliampere, with X rays (hardness, 8 on the Benoist radiochromometer, 15 cm. on the spintometer), with the anticathode at a distance of 25 cm. from the surface of the body.

Liver and spleen being, as we have seen, antagonistic, great care must be taken in order that during radiation of the spleen the rays should not reach the liver; radiation of the spleen should be made either from front or back, but not from the side. When the tube (8 cm. diameter for adults), whose sides are impermeable by X rays, is being placed in position, care should always be taken that the rays do not reach the left lobe of the liver. The limits of the position of the tube are at the front the left mammary line, at the back the left scapular line; the lower limit is always the lower edge of the thoracic cavity. Experience has shown me that the frequency of spleen radiations in *acute malaria* should be regulated according to the form of disease present. In quotidian fever a radiation should be given every day with interruption for five or seven days if reduction of temperature has not begun after the tenth application. In tertian and quartan fever the radiations should be made on the eve of the attack.

In *chronic malaria* spleen radiations should be applied every two, three, or five days, according to the facts of the individual case. If one series of 15 radiations is insufficient for the establishment of a complete cure the patient should be rested for a month, and treatment then recommenced, again not exceeding the number of 15 radiations. In very refractory cases a third series of radiations of the spleen should be given after another month's rest.

Methods of Manoukhin and Senn Compared.—My method of radiation of the spleen differs completely from the method widely employed since its institution by Senn. Senn introduced the use of large doses of X rays; I employ very small doses. Heavy doses have the effect of destroying the treated cells; I propose simply to stimulate the function of the spleen cells without injuring their vitality. Senn's method is concentrated upon local effect, whereas I try to obtain a general action—just as Behring, Kitasato, Wernicke, and Roux, in place of local therapeutics of diphtheria and tetanus, introduced the treatment by passive immunity of the injured organism. I have replaced local X ray treatment by stimulation of the active immunity provoked by the influence of rays on the organ which directs the defence of the whole organism against infection. By the by, I believe that Fontoynon [50] has misunderstood my method if, having identified my conception with that of Senn, "he has never seen radiotherapy alone acting in malaria."

Clinical Evolution of Malaria under the Influence of Self-defensive Treatment.

I began to apply my treatment in 1914, at Kiev, where my hospital patients included none but severe cases of malaria.

Controls.—I compared my results with those of an adjacent hospital (Hospital No. 19), where comparable cases were treated almost exclusively with quinine (after trials of arsenical preparations which were found to be less trustworthy and less stable). In a very small number of cases I was able to compare my results with those obtained by neosalvarsan treatment.

Statistics.—My figures obtained at this hospital relate to 61 cases, comprising 23 tertian, 10 quartan, 11 simple tropical malaria (*Plasmodium præcox*); 4 mixed tropical malaria (*P. præcox* + *P. vivax*); 2 pernicious malaria of a comatose and delirious form (*P. præcox*); and 11 cases where the parasite could not be identified in the peripheral circulation, and where the condition was either characterised by an irregular temperature or appeared in the form of quotidian fever. Later I was able to practise my method of treatment with the same technique at Petrograd, where I had 24 patients with chronic malaria. (I have excluded from these statistics 13 cases of acute malaria, with parasites identified in the blood, which came into my hospital by chance, and not by way of the Front. They recovered in 1–2 days after the beginning of treatment; I do not wish to base any conclusion on such favourable cases.) All the malaria patients treated by me at Kiev were definitely cured. Out of 24 patients treated in Petrograd (most of them coming from the Caucasus) I obtained a complete cure in 22 cases; 9 of these required two or three series of spleen radiations. In two cases where the spleen was voluminous and very much indurated I was obliged to stop the treatment after several trial radiations; the splenic tissue, having undergone too great a fibrous degeneration, no longer reacted to excitation, and the production of leucocytolysins was nil. After this experience I was astonished at the unexpected conclusion drawn by Tanon, Gastou, and Segal at the time of my communication in December, 1922.[50] They believed that my treatment was "especially indicated in cases where chronic alterations of liver and spleen are present." I have just shown that chronic alterations of the spleen constitute a considerable obstacle to the success of my treatment, necessitating a much longer time and, in exceptionally severe chronic cases, rendering treatment inactive. Normal function of the splenic cell is thus absolutely necessary for my treatment.

Fall of Temperature.—The influence of X rays on the spleen most frequently began to appear in the temperature only after the eighth to tenth radiation, as the cases were severe. These 8 or 10 radiations—and sometimes even 3 to 5 radiations—were sufficient to reduce the temperature to normal. In some cases 10 to 15 applications were needed, but I have never had to go beyond 20 to overcome the most recalcitrant cases of quartan and tropical fever. The method of fall of temperature in my cases of acute malaria differed widely; sometimes the fall was abrupt, sometimes the pyrexial periods diminished progressively and the temperature fell by lysis. In certain cases, before the definite fall, tertian or quartan fever was transformed into quotidian fever; the temperature then fell at once, abruptly or with several oscillations.

The four charts (Figs. 1, 2, 3, 4) show axillary temperatures of soldiers treated and cured by me at the Kiev Hospital.

FIG. 1.

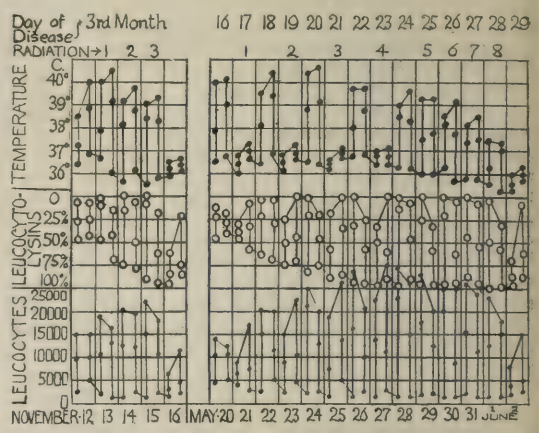


FIG. 2.

FIG. 1.—Patient, aged 22, treated in November, 1914; *P. vivax* identified; quotidian fever; the temperature fell abruptly and finally after the third application of rays.

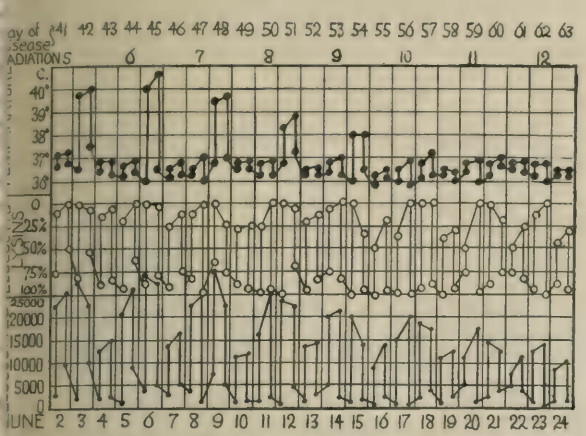
FIG. 2.—Patient, aged 25 years, treated in May, 1915; tertian fever; *P. vivax* identified; temperature fell by lysis after eight radiations; tertian form transformed into quotidian form.

The charts show that identification of the parasite does not make it possible to foresee the number of radiations of the spleen which will be necessary. Thus, six radiations were required for the treatment of a mixed form of malaria due to *P. præcox* + *P. vivax* (Fig. 4), whereas 8 and 3 radiations were needed respectively for two cases (Figs. 1 and 2) determined by *P. vivax* alone. Nevertheless, experience has shown me an incontestable sign on which prognosis can be based. When tertian or quartan fever is transformed into quotidian fever, it can be stated that the disease is giving way to treatment, and that the fall of temperature to normal is imminent. It is equally impossible to foresee by means of the temperature curve whether the latter will fall abruptly or by lysis. The rapidity of this fall to normal in acute malaria treated by radiation of the spleen depends entirely on the patient, whose physical resistance and psychical state play a preponderating part in the matter. At the Kiev Hospital the patients who required longest treatment were prisoners of war, psychically depressed, and soldiers exhausted by enormous marches and insufficient nourishment.

Disappearance of Clinical Symptoms.—The liver and spleen diminished in volume with the fall of temperature and, in acute cases, resumed their customary dimensions either at the time when the temperature has reached the normal, or else in the following eight days. In malaria accompanied by icterus the latter disappears with the fall of the temperature.

The patient's weight goes up. The disappearance of parasites in the blood is accompanied by a rapid increase of the quantity of hæmoglobin. The red corpuscles also take on their normal aspect and their number shortly reaches the usual figure. The explanation is as follows: I was able to establish the fact that

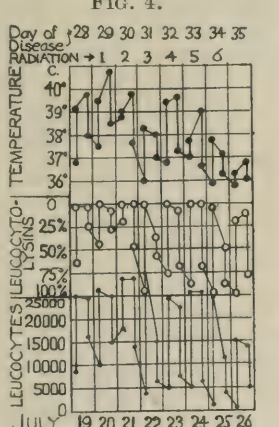
FIG. 3.



Patient, aged 24, treated in June, 1915; quartan fever; *P. quartanum* identified; the temperature fell by lysis after 12 radiations.

radiation of the spleen provokes an increase of red corpuscles and of hæmoglobin in the blood. Recent communications of Béclère [51] and Vaquez [52] confirm the observation that spleen radiation with small doses of X rays leads to an increase of red corpuscles in blood. It is of importance to remember this detail of the action of X rays upon the spleen, for in no case should treatment be stopped before the hæmatological formula has returned to normal. Thus I follow this rule: About 15 days after the last radiation, if blood examination shows that the quantity of hæmoglobin and the number of red corpuscles are not yet normal, another few supplementary radiations should be practised under the control of frequent hæmatological examinations. This eventuality does not often arise after 15 days; the blood formula of the patient cured of acute malaria is usually normal. If supplementary radiations are necessary they should be made every 5–6 days.

FIG. 4.



Patient, aged 25, treated in July, 1915; mixed tropical malaria; *P. præcox* + *P. vivax* identified; irregular intermittent fever; temperature fell definitely after sixth radiation.

Advantages of Self-defensive Treatment.

From a comparison of results obtained at Kieff by the self-defensive treatment and by quinine, in the two hospitals before alluded to (my own and No. 19) I drew the following conclusions: 1. No. 19 hospital, where quinine was used, had deaths to report, whereas my hospital had none. 2. The benign clinical evolution of malaria in the patients submitted to the spleen radiation was striking, their general condition improving after a few applications of the rays. 3. The duration of the disease was shortened on an average to nearly a third of the duration observed with quinine treatment. 4. No. 19 hospital contained some more or less pronounced quinine-resistant forms of malaria; patients who left my hospital all showed a definitive return to the normal conditions of the blood. 5. Several relapses were observed in quinine cases, even before the patients had left hospital; I was fortunate in being able to keep in my hospital all patients who had undergone my treatment for at least a month after their recovery. It was also possible to examine about 50 per cent. of my patients a year and two years after the end of their treatment; in none of the 50 per cent. could any return of malaria be found or reported. 6. Finally, in self-defensive treatment we have a powerful expedient in cases of quinine idiosyncrasy. I was able to report to the Société de Médecine et d'Hygiène Tropicales de Paris a case of this idiosyncrasy cured by self-defensive treatment.[50] Comparison of the results of my method with those obtained in the few available cases treated by neosalvarsan gave still more strikingly in favour of the former.

Regular Reproduction of the Hæmoleucocytolytic Reaction by Self-Defensive Treatment.

The constancy of positive results obtained by self-defensive treatment can only exist on condition that this treatment reproduces exactly the phenomena of the defence of the attacked organism.

A distinguished Russian clinician and therapeutist, S. P. Botkine,[53] used frequently to state that "The faculty of cutting down, of aborting the morbid state exists in the human organism itself; the problem is to track it down and render more efficacious the means which the organism uses for getting rid of the infection. It seems to me that in the study of these natural abortive forms, in the knowledge of procedures utilised by the morbid organism we shall find means of aborting disease." The laboratory and the clinic have definitely established my conviction that leucocytolysis appears to be the process utilised by the organism to free itself from any infection; I propose artificially to provoke the process by means of a new principle of treatment, by "the self-defensive struggle," which I have instituted and have here described.

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(*Continued at foot of next page.*)

REMARKS ON THE PATHOGENICITY OF COMMON INTESTINAL WORMS.

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NO ONE will deny that parasitic worms play a definite and far from unimportant rôle as pathogenic agents, but for some inexplicable reason they are generally regarded as the special concern of the *tropical* pathologist. The suggestion that the commoner helminths have any part in the causation of diseases occurring in this country appears to arouse in certain quarters considerable opposition, and in view of this it is not surprising that helminthology, as a branch of medical and veterinary science, has received comparatively scant attention and encouragement. It is, therefore, the more remarkable that anyone here should have attained eminence in this particular subject. As it happens, comparatively few have.

It is not particularly easy to account for this peculiar circumstance. Parasitic worms are admittedly common enough even amongst the apparently healthy, and, moreover, more or less sound teaching with regard to them finds a place in the best text-books of pathology published in this country, though it is perhaps doubtful if it occupies a proportionate amount of time in the class-room, the teaching laboratory, and the clinic. As a result one cannot avoid the conclusion that diseases due to helminths are not, as a rule, recognised. The remarkable and exceptional cases which have been recorded from time to time bear witness to this supposition.

It would be unreasonable to expect the busy general practitioner to devote the time necessary to establish in every case a diagnosis of intestinal helminthiasis. In many cases of oxyuriasis, of course, a reliable diagnosis can be based on a few well-known symptoms. In most cases of ascariasis and trichocephaliasis, however, the symptoms are either obscure or so pleomorphic that quite a variety of different diseases, not necessarily intestinal, may be simulated. In illustration of this, such cases as those reported by Jamieson and Lauder (1910) and Kahane (1907) are of interest. Moreover, the literature on the subject is so scattered that an altogether unreasonable amount of time is usually wasted in ascertaining its existence and in collating the various items. On that account it would seem that some useful purpose might be served by presenting these items in an accessible form. An equally desirable object would be attained in drawing attention to the fact that a fairly comprehensive literature on the subject does actually exist and that it deals with many varied aspects. As to the precise value of this literature doubts may justly be entertained in particular instances.

In this connexion the bibliographical work of J. C. Huber[1] served a very useful purpose. It has, however, been merged in the much more comprehensive and voluminous "Index Catalogue of Medical and Veterinary Zoology."[2] Amongst the more useful bibliographies of subsequent date are those of G. Railliet[3] and Leiper.[4]

The Conclusions of Railliet.

To my mind the most important and unprejudiced opinions which have hitherto been published on the subject are those of Railliet, who, it should be noted, is a clinician and not a helminthologist. These opinions, though not immune to criticism, are eminently reasonable and free from bias. As the volume in which they were published is rare, I take the liberty, with the author's permission, of presenting here a translation of his principal conclusions, which are as follows:—

Intestinal worms are, in general, more frequent in infants than in adults; ankylostoma, however, is rare, and bothriocephalus exceptional in infants. The frequency of the different species varies according to the country. In Paris trichocephalus is very frequent, oxyuris little less common, and ascaris rarer. The last is more widely distributed in rural districts.

In former times nervous disturbances were those most frequently noticed because they are most striking. They have been described as sympathetic or reflex, but they ought really to be regarded as toxic, infectious, or toxi-infectious. They occur almost exclusively in predisposed subjects of a neuropathic disposition. At the same time, the influence of coexisting digestive troubles must not be ignored. These multiple factors make it difficult to determine exactly the part attributable to helminths in the production of these ill-effects. Nevertheless it is certain that helminths are the occasional, if not actually determining, causes of convulsions and of various obscure troubles classed under the term "neuroses," of which the number is constantly diminishing. The reality of verminous pseudo-meningitis, in particular, is proved by lumbar puncture. This is of differential importance, as the prognosis in such cases is, of course, favourable. There also occur ocular troubles of such importance as to demand cognisance on the part of ophthalmologists.

The study of cutaneous disorders, apparently neglected by dermatologists, opens a field for much interesting research. Amongst the local disturbances the peri-anal lesions of oxyuris will certainly be found to be more frequent than would appear. The ætiology of pruritus ani is not well known. Moreover, the subject of erythema is one on which a chapter remains to be written.

Accidents of a surgical nature, due almost entirely to ascaris, are of varied interest. Intestinal perforation is theoretically possible, but no observation has so far been absolutely convincing. The occurrence of primary verminous abscesses is not proved beyond question. Except in the unusual case reported by Fröhlich (oxyuris), the cases deal in reality with peritoneal collections in direct communication with the lumen of the intestine. The occurrence of intestinal obstruction, however, is quite beyond question and is of great medical and surgical interest. Tumours, due to clumps of ascarids in the intestine, may give rise to errors of diagnosis.

Worms, generally oxyuris, are frequent in the appendix of children, but they appear to be as frequent in normal as in affected appendices. Both oxyuris and trichocephalus frequently occur in the wall o

(*Continued from previous page.*)

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the normal appendix, and may thus inoculate bacteria into the wall. The possibility of helminthic appendicitis is therefore real; only its frequency is in doubt. Anthelminthic treatment has been found of no avail for worms in the appendix, and, indeed, its employment may be actually dangerous in cases of acute appendicitis. Two points must be noted—namely, that the presence of worms in a case of appendicitis constitutes a possible source of aggravation, and that ascarids sometimes give rise to symptoms simulating appendicitis (pseudo-appendicitis).

Gastro-intestinal disturbances are usual in helminthic infections, and may simulate a variety of diseases such as muco-membranous enteritis, dysentery, cholera, &c. Trichocephalus enteritis, however, does not appear to present a sufficiently clear-cut picture to be classed as a definite morbid entity. Intestinal worms may cause fever. Transient febrile states are frequent enough, but the question of helminths as inoculating agents of typhoid fever remains sub judice.

The existence of helminthic anæmias is now generally admitted. Trichocephalus and ankylostoma may cause severe, even fatal, anæmia; but only bothriocephalus anæmia presents the characters of a pernicious anæmia. Intestinal worms not infrequently migrate, especially into the bile-duct and pancreatic duct; or into the respiratory passages, where they may cause fatal asphyxia.

In certain cases helminths appear to have caused sudden death, and have thus become of medico-legal interest.

In summing up, Railliet suggests that, while avoiding the exaggerated misconceptions of the past, it appears advisable to constantly bear in mind the possibility of untoward contingencies due to parasitic intestinal worms. In the case of obscure children's ailments every practitioner ought to put the question to himself, "Has the child worms, and, if so, what kind?" In any case of doubt, where no contra-indication exists, a vermifuge might with advantage be administered.

Notes Based on Personal Experience.

Little comment on the foregoing is necessary, but the following notes, based on personal experience, may not be out of place. The subject of nervous disturbances associated with worms is one on which a volume could be written. These may assume various forms, but are most commonly of a choreiform or "hysterical" type. Amongst the most classical is the well-known phenomenon of dirt-eating (*pica*), which is frequently well marked in hookworm cases. This, however, is only a special instance of the general symptom, vicarious appetite, common to infections with most intestinal worms, and not by any means confined to human cases.

The association, under certain circumstances, of parasitic intestinal worms with ocular disturbances has been observed by numerous clinicians. Here again toxic action is called into account, but in certain cases—e.g., ankylostoma—the ocular troubles, such as hæmorrhages, are similar to those not infrequently met with in cases of anæmia of non-parasitic origin.

The occurrence of cutaneous disturbances is, to my mind, not the least cogent evidence of toxic action. So far as one can judge, the phenomena are somewhat analogous to those associated with serum rashes. Quite a number of cases are on record, amongst the most interesting of which are those discussed by Ransom at a meeting of the Helminthological Society of Washington in 1922. As Railliet correctly concludes, much remains for investigation in this connexion

That intestinal worms may cause, or be associated in the causation of, enteritis there is not the slightest doubt. Even excluding the large number of cases in which worms are simply concomitants of other enteritis-producing organisms—bacterial, protozoal, &c.—there remain many in which intestinal worms are, indisputably, at least the initiating cause of the trouble. While no one would suggest that ascaris or trichocephalus is a cause of typhoid fever or cholera, yet there are many indications that worms may function as potent predisposing or accessory factors in these diseases. Guerrini's statistics (1915) in regard to cholera, for instance, undoubtedly point that way. The actuality of enteritis due to strongyloides is also beyond dispute. The fact that this worm, like ankylostoma, normally infects through the skin, and that before it reaches the intestine it passes some time in the tissues, blood-vessels, and lungs, would appear to suggest that by the time it reaches the intestine its extraneous bacterial contamination will be slight, if any. Again, there is no doubt that when it does eventually reach the intestine it frequently, within a short space of time, initiates a violent enteritis. These statements, I may add, are based on the result of personal observation and experiment.

It is well known that strongyloides and ankylostoma are not infrequently associated, and their mode of infection is more or less similar, but, in my experience, early ankylostoma infections are not characterised by marked enteritis; on the other hand, early strongyloides infections and mixed infections are frequently associated with severe diarrhœa, the stools in which are almost characteristically fœtid. It seemed to me to be frequently, though not invariably, possible to diagnose the presence of strongyloides from the character of the stool alone, such diagnosis being later confirmed, quite apart from examination of the eggs, by the appearance in fæcal cultures of the heterogeneous form.

The association of intestinal worms with atypical febrile conditions has been noted. This may be taken to be correlated to some extent with toxic action, but the relation is at best obscure, and fever does not, as a rule, play a prominent part in the symptomatology of unmixed helminthic infection. It may, however, ensue as a result of gastro-intestinal disturbance. On the other hand, anæmia of greatly varying degree is one of the most frequently quoted syndromes. The nature of this anæmia has been, and still is, a matter of some difference of opinion. This is possibly due to the fact that "helminthic anæmia" is far from being a single pathological entity. The species to which anæmia of a high degree has been attributed are the hookworms and the broad tapeworm, *Dibothriocephalus latus*. The anæmias resulting from these infections are not, however, of the same type. Hookworm anæmia, at least in early cases, appears to prevent the typical features of a secondary anæmia, though it is doubtful if this description applies in every case. On the other hand, with dibothriocephalus there is no intestinal hæmorrhage, and the resulting anæmia, according to Tallqvist, resembles a true pernicious anæmia.

The rôle of trichocephalus and certain other worms in the production of anæmia is decidedly more obscure. For the present it appears best to admit that there is an element of doubt, while drawing attention to the fact that Railliet and many independent observers have brought forward clinical and experimental data to support the view that anæmia of less or greater degree not infrequently results from, or is associated with, many parasitic intestinal worm infections. This appears to be an essentially fit and proper subject of further medical research, such as is being, or about to be, conducted in France.

The Surgical Side.

On the surgical side the available data are perhaps more clear-cut, even striking. The outstanding and most frequently observed surgical lesion is biliary obstruction due to ascaris. The frequent records of its occurrence serve to indicate that its possibility should be considered in cases of obstructive jaundice. Verminous appendicitis, however, is the subject which has given rise to greatest controversy. Railliet's views are moderate, and therefore worthy of attention. His observation that both oxyuris and trichocephalus actually pierce the wall of the appendix is

significant, though not necessarily proof conclusive. It is, moreover, obvious that ascaris may cause appendicular obstruction almost as readily as it causes biliary obstruction, but whether that gives rise to, or produces symptoms simulating, appendicitis is, of course, another matter. Most strenuous of all upholders of the theory of the verminous causation of appendicitis is Rheindorf, but his very insistence naturally engenders opposition. More recently Eastwood has apparently demonstrated the absence of any causal relation between oxyuris and appendicitis. His work, though there may be flaws in its presentation, is undoubtedly the most cogent on the negative side. He argues that because oxyuris is very frequently found in normal appendices, and does not cause a local eosinophilia, it cannot therefore be a factor in the production of appendicitis. Until, however, the entity and ætiology of appendicitis can be satisfactorily demonstrated, it seems wise to admit, and bear in mind, that intestinal worms may either, indirectly, cause appendicitis or, what is of equal clinical importance, give rise to symptoms simulating that disease (pseudo-appendicitis).

How one may absolutely distinguish the false from the real has not yet transpired, but should such a distinction be clinically feasible it would have the desirable result of obviating unnecessary surgical interference. Appendicectomy has, as we know, of late years descended from the fashionable to the commonplace. Its necessity, while unfortunately only too real, is possibly in danger of becoming exaggerated. In any case, however, whether intestinal worms cause appendicitis or not, the fact will not affect the treatment, expectant or operative, of that disease, though obviously it certainly affects the question of possible prophylaxis.

A matter with which Railliet does not deal, but which has since come into prominence, is the relationship of intestinal worms to pneumonic disease. The fact that ascaris, and possibly trichocephalus, spends part of its larval developmental life in the lungs must put an entirely different complexion upon our views with regard to the pathogenicity of these common intestinal worms. A discovery such as this is added evidence, if such were wanting, of the necessity for keeping an open mind in every department of medical research. The shibboleth and the *ignis fatuus* are equally unreliable guides.

Conclusion.

It seems to me that the whole subject is one that requires and demands much further research from various points of view. While it would be absurd to accept all the observations and opinions of the older writers, amongst whom there was a tendency to ascribe many diseases of unknown ætiology to the malevolent action of very obvious worms, it appears to be equally benighted to adopt a diametrically opposed view.

This swaying of opinion is not confined to helminthology. It affects, equally, bacteriology and other branches of preventive medicine. While, therefore, the greatest caution must be, and generally is, exercised in making any positive assertion, an even greater reserve must be adopted in giving expression to any unqualified general negation—if for no other reason than that it is usually much easier to demonstrate a positive than it is to prove an absolute negative.

As from the foregoing it may be obvious that the subject of so-called "common" intestinal worms is worthy of at least a little more attention than at present it appears to receive, I venture to think that some good purpose might be served by the compilation of an up-to-date bibliography containing the more important clinical records of recent years. Such a bibliography, which I purpose publishing shortly, if it achieves no other object, may at least save the time of others who may be interested in the matter, and who may have occasion to consult the available, but unfortunately much scattered, literature on the subject.

THE "ELECTRONIC REACTIONS" OF ABRAMS (E.R.A.).

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PAST PRESIDENT, AMERICAN ELECTROTHERAPEUTIC ASSOCIATION.

Dr. Albert Abrams claimed that his "electronic reactions are either the greatest miracle of the age, or else the greatest fake," and after careful investigation it would appear that this second claim is justified. A brief and concise definition of what is meant by "electronic reactions" is well-nigh impossible, but a general idea may be gained by studying the principles as set forth by Abrams. These are:—

"1. Physiologic phenomena are manifestations of electronic energy.

2. Pathologic phenomena are manifestations of perturbed electronic energy.

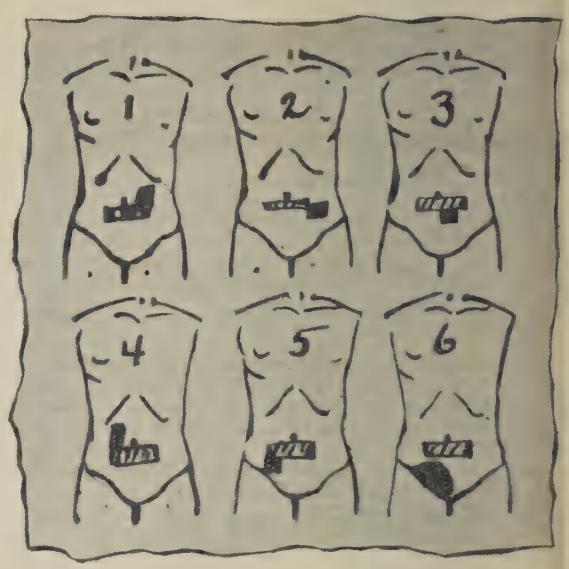
3. The energy in health and disease has an invariable and definite rate of vibration (determinable by the electronic reactions).

4. Specific drugs possess a like vibratory rate as the diseases for which they are effective. These like vibratory rates (homovibrations) of drugs owe their efficiency to their inherent radio-activity.

[So an obsolete drug like gamboge painted on the chest in incipient tuberculosis will effect a symptomatic cure within a few weeks. Gamboge possesses the same vibratory rate as tuberculosis. Our conception that drug action is dependent on cellular contact is thus demolished.]

5. All forms of energy whether derived from heat, electricity, or magnetism may be made to yield different rates of vibration and these rates corresponding to the diseases are utilised for their destruction."

FIG. 1.



This chart represents the areas of dullness Abrams claims to have found in determining the religion of individuals by means of the E.R.A. (1) Represents the areas of dullness for Catholic, (2) Methodist, (3) Seventh-Day Adventist, (4) Theosophist, (5) Protestant, (6) Jew.

These rates of vibrations are obtained or determined by means of an instrument known as the oscilloclast. It has also been called in the United States press—

"A contraption which might have been thrown together by a ten year old boy who knows a little about electricity, to mystify an eight year old boy who knows nothing about it."

Abrams says that it is an apparatus for treating diseases by definite rates of vibration on the theory that every disease has its own vibratory period and that by increasing the force of the vibrations by means of the oscilloclast you shatter the disease.

It is possible that the electronic theory is not yet

quite so clear that a quotation from its originator may help to make it more intelligible :—

"Electrons and not cells are the units of the body. Electrons are charges of electricity and the basis of the material universe, including man. Electrons have invariably uniform vibrations, and it is only in the rate of vibrations

FIG. 2.

The "oscilloclast" (patent pending) as pictured in *Physico-Clinical Medicine*, June, 1919.—(From the *Journal of the A.M.A.*)

that we can distinguish one object from another object . . . During the revolutions of electrons, thousands of billions of times per second, their vibrations (radiations) escape. Many are perceived as light, heat, electricity, and so on, but most of them are unrecognised, because they have thus far eluded all scientific instruments.

Vibrations can destroy disease. Every object has a natural period of vibration. If one approaches an object with a source of vibration of the same vibratory rate as itself, the object will be set in vibration. This forced vibration of the object may attain such a magnitude as to fracture and utterly destroy it. Caruso could take a wine glass and determine its tone (vibratory rate) by tapping it. Then by singing that tone in the glass, would shatter it. This is exactly what happens when you impose on a disease its own vibratory rate by the oscilloclast."—"Catechism of the Electronic Methods of Dr. Albert Abrams." Abrams.

Thus every illness is due to erroneous vibrations of the electrons. Up till now we have believed that the size of an electron is so minute that the most powerful microscope is useless to render it visible to the human eye, and that there is no direct means of measuring the size of it. But the discovery of Abrams, if proved, would upset our present conception of matter. The education of electrons and teaching them their proper vibratory rate, thereby curing the diseases which their faulty vibration is causing, is a claim with which no scientific discovery of any age can compete.

The three diseases which are usually diagnosed and (or) treated by the Abrams method are syphilis, malignant disease—chiefly carcinoma—and tuberculosis. But the claims of Dr. Abrams are by no means limited to the diagnosis and cure of disease. By means of another instrument which he calls the "sphygmobiometer," which has been called by a detractor "a bunch of junk," he claims to establish the parentage of a child through comparison of the vibrations of a drop of the child's blood with those of the blood of the supposed father. He has appeared in the witness box in a court of law to give evidence in support of determining the parentage of a child. It is not on record that the court accepted the test as final.

Another claim, perhaps not so sensational but equally bewildering to the man whose scientific education is limited to the more generally accepted theories, is that he can with a tuning-fork measure the vibrations of light waves emitted from colours, these being in the hundreds of millions and the maximum vibrations of tuning-forks being about 16,000. Nor does the tale of the marvellous claims or suggested claims allied to the basic discovery cease here. There is an Abrams theory which attributes sexuality to sound, and also to numbers, while by the E.R.A. it is said to be possible to determine the religion of individuals. Fig. 1 is a reproduction from Dr. Abrams's own journal (*Physico-Clinical Medicine*, September, 1922).

These areas of religious dullness are obtained and other diagnoses made by the Abrams oscilloclast. This is a box on the outside of which is a motor and a current breaker which run when the machine is connected to the ordinary electric lighting circuit. There are also two controls, the function of which is not evident. The current breaker is not electrically connected to anything at all (Fig. 2).

The diagram of the wiring (Fig. 3) is particularly interesting, for with our own knowledge of electricity it would appear to be impossible for any electric current

FIG. 3.

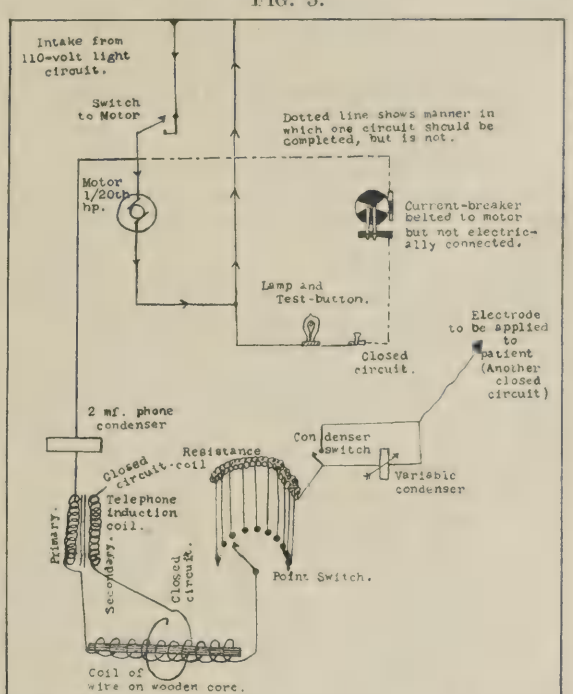


Diagram of the wiring of the oscilloclast.—(From the *Dearborn Independent*, February and March, 1923.)

in any form to pass from the intake (top left-hand corner) to the patient (right side), and this is borne out if a galvanometer be placed between the electrode and the patient, no deflection of the needle can be seen to be taking place at any time.

There is a shelf inside the box which separates the upper half from the lower. In the centre is an "induction coil" consisting of one wire wound round a wooden core and covered with paraffin and a pasteboard tube, the whole thrust through a wooden wheel around which is wound one strand of wire which is then cut off, completely closing the circuit and insulating the two wires by means of some 4 inches of wood. Had we not Dr. Abrams's assurance to the contrary, we should have to believe that this coil is worthless so far as the transmission or induction of electricity is concerned, which is the conclusion of Mr. Frank Rieber, head of the Rontgen Appliance Corporation of San Francisco. Shorn of technical wording a report of experts, of which Mr. Rieber was one, at the instigation of the *Dearborn Independent* made four important findings.

1. That no current appreciable to the most delicate galvanometer passes from the oscilloclast to the patient. Since the vibrations are carried by the electric current, it

is obvious that no vibrations pass from the oscilloclast to the patient.

2. That the construction and the wiring of the interior of the oscilloclast is such that no electrical current could pass through the machine, and that this wiring and construction show a profound ignorance on the part of the inventor of all the laws of electricity or of handling of the electric current.

3. That the only possible result of the application of the electric current to the oscilloclast is the turning over of the armature of a small motor and the rotation of a small current-breaker which is belted to the shaft of that motor, both of these having been purchased by Abrams from the common stock of an equipment store and installed on the outside top of the oscilloclast.

4. That there is more electricity in a handshake, or in the "laying on of hands" than is delivered by the oscilloclast. That is to say, that the ailing human body would receive more vibration and a greater quantity of electricity from the work of a competent masseur using one hand than it would from a whole battery of oscilloclasts.

The concluding paragraphs of the report of Mr. Frank Rieber may be quoted:—

"From an observation of the internal arrangement of the oscilloclast shown on the accompanying diagram this is not surprising. Several of the circuits have no beginning and no end. That is, they are not complete, but terminate in dead-ended wires. There is therefore no place for the electricity to go on these circuits and nothing it could possibly do if it got there. Further, the electrical system in the oscilloclast does not constitute any known means for either generating or utilising the electrical oscillation. If the circuits employed have any purpose at all, this purpose is not of the sort to be evident to anyone familiar with electrical engineering or physical laboratory practice."

Now as to the manner in which this instrument is used to obtain the electronic reactions of Abrams. There are two general methods of making diagnosis, one in which the patient is present in person and the other in which the patient is represented by a specimen of blood, saliva, or handwriting, while the reactions are obtained by percussing the abdomen of a healthy young man who serves as a proxy. He stands on metal plates duly grounded. He is connected with the apparatus by means of a piece of metal on his forehead. The lights must be dimmed so as to have a minimum of light energy interfering with the delicate processes involved. He stands erect, hands held downwards, palms outwards and forwards. He must be facing west. The diagnostician sits in front of the proxy, or human reagent, and percusses his abdomen, and different areas of dullness or different percussion notes appear or disappear in varying situations according, so says Abrams, to the emanations, or vibrations, flowing from the drop of dried blood, or saliva, or handwriting, through the apparatus to the abdomen of the proxy. It should be mentioned that in order to eliminate extraneous electronic impressions the sample of blood or other matter is wiped, so to speak, with an ordinary horseshoe magnet. Later on a horseshoe magnet is suspended over the head of the reagent. This is to help to differentiate electronic reactions. When it is realised how localised is the magnetic force of a small horseshoe magnet, the extreme sensitiveness of these reactions is dimly perceived and with such extreme sensitiveness it is only natural that error may creep in from time to time, even as in the older and more firmly established medical methods. And the diagnoses made by Dr. Abrams and published by him (*Physico-Clinical Medicine*, March, 1922) appear open to fallacies or errors of experiment.

Autograph.	Date of writing.	Remarks.
Dr. Samuel Johnson	Feb. 7th, 1775.	Reaction acquired syphilis (cerebro-spinal strain) and tuberculosis.
Edgar A. Poe ..	Dec. 30th, 1846.	Cong. syphilis (cerebro-spinal) and reaction of dipsomania.
H. W. Longfellow	May 14th, 1855.	Cong. syphilis.
Oscar Wilde ..	No date.	Cong. syphilis, male reaction. Female reaction 1 16/25. Acquired syphilis (cerebro-spinal).
Samuel Pepys ..	July 5th, 1693.	Cong. syphilis (cerebro-spinal).
Bret Harte ..	No date.	Jewish on father's side. Cong. syphilis (cerebro-spinal).

These diagnoses, it will be seen, were made by the second method from samples of handwriting of deceased persons in this particular instance.

And yet one or two more examples which may tend to shake conviction in the infallibility of E.R.A. or harden the sceptic in his scepticism. The first case is reported in the *Boston Medical and Surgical Journal* (Oct. 19th, 1922):—

"At a meeting of the Massachusetts Medical Society, Dr. Abrams having, it is said, refused to submit the method to any test which was offered him said he would confine himself to demonstrating the presence of lesions 'the existence of most of which could be proved only by post-mortem examination.' A member of the staff of the *Boston Medical and Surgical Journal*, a man in perfect health, was selected for experiment. By his diagnostic methods Abrams discovered in this healthy individual a streptococcus infection, tuberculosis of the intestinal tract, congenital syphilis, and intestinal sarcoma—otherwise the man was all right! It is understood that the volunteer inconsiderately refused to submit to a post-mortem examination."

The *Journal of the A.M.A.* (Dec. 30th, 1922) relates another case, many similar cases being cited weekly in the United States. A blood specimen was collected in the presence of three reputable physicians in a town in Oklahama and sent to a Dr. E——, medical director of a "Physico-Clinical Laboratory for the Electronic Reactions of Abrams." The report was, "Congenital diminished resistance," which is a euphemism of the cult for syphilis acquired or congenital, and appears in most reports, "cerebro-spinal and digestive strain; metastatic carcinoma, liver and right colon. Tuberculosis, genito-urinary tract. Colisepsis. Streptococcic infection in gall-bladder region." The specimen of blood, it appears, was not taken from any human being at all, but was obtained from "an unsuspecting and believed-to-be virtuous female guinea-pig. The pig was duly arranged facing west when the blood was taken." To another professor of electronic diagnosis was sent a drop of blood from a male guinea-pig, and diagnosis was made. In addition, of course, to the congenital syphilis, there was "digestive sarcoma of the cardiac end of the stomach and streptococcic infection of the left frontal sinus, of the gall bladder, and '*of the left tube.*'" For the oscilloclast to be able to find a reaction for pus tubes in the blood of a male guinea-pig stamps this instrument as unique.

One more instance of the wonders of the diagnoses which are attributed to the oscilloclast will perhaps enable us to say that the claim of Abrams that "it is the greatest miracle of the age or the biggest fake" has justification. Dr. J. J. Blue, of Saginaw, Michigan, in order to test the diagnostic ability of one of the disciples of Abrams, sent a cheque and sample with a request for diagnosis. The following is a report of the diagnosis made from the sample of blood submitted:—

"Congenital and cryptogenic syphilis; congenital gonorrhœa; carcinoma of stomach, small and large intestine, colon, pancreas, kidneys and bladder; epithelioma (not localised); sarcoma of spine; chronic malaria; diabetes. That may look like a formidable array of diseases to you, but it is not so bad from an electronic standpoint. I cannot give a prognosis without a personal examination, but if all other things are equal your chances for recovery are very good."

The cheery optimism of the professors of the electronic reactions of Abrams, in face of this formidable array of human diseases, was wasted. The specimen of blood had been taken from a perfectly respectable Plymouth Rock rooster which had been confined in a well-ventilated coop since its birth. It may be that the rooster was not facing due west, or that the light was not sufficiently subdued at the time the blood specimen was taken.

I am indebted to the *Journal of the A.M.A.* of various dates; to the report on the investigation instituted by the *Dearborn Independent* appearing in the February–March, 1923, issue of that paper; and to the *Boston Medical and Surgical Journal*, and also to several numbers of *Physico-Clinical Medicine*. I have also to thank several medical men who have shown me the oscilloclast and have given me their experiences with it, but perhaps the reader will have had enough. Comment has been avoided and facts only have been stated, as they have been ascertained by observers, both as regards construction of the instrument and the nature of the electronic reactions and the diagnoses obtained.

A TECHNIQUE FOR CYSTOSCOPY IN THE PRESENCE OF PUS AND BLOOD.

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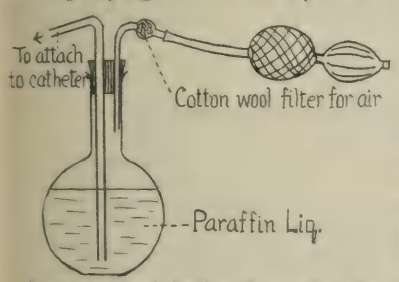
IT is a matter of common experience that cystoscopy in the presence of pus or blood may be extremely difficult or even impossible, a state of affairs which may not be remedied by repeated irrigation of the bladder. The following method is suggested to overcome this irritating difficulty. I say suggested because, although the method has been used in a number of cases with success, a sufficient amount of experience has not been gained to judge of its ultimate utility or its worthiness of a place in the armamentarium of the urologist. The object of publishing this note is to afford an opportunity to all to test the method, each for himself.

The method depends for its action upon the immiscibility of oil and water, oil in this instance being used as a medium for the transmission of light. On account of the physical properties of the oil it will always remain clear and free from admixture of blood, pus, or urine.

Technique.—After the passage of a catheter the bladder is washed out in the usual manner. A sufficient amount of sterilised paraffin liq.—i.e., about 8 or 10 oz.—is injected through the catheter either by means of the apparatus shown in the accompanying sketch or by means of a Higginson syringe. It is advantageous to use warm oil at body temperature and as large a catheter as feasible. The cystoscope is dipped into sterilised paraffin and then passed into the bladder. The oiling of the cystoscope must be regarded as an important detail, since the paraffin acts in the dual capacity of a lubricant and a protective layer to the lens. The examination of the interior of the bladder is carried out in the usual manner, but it will be noted that urine passing through the ureter does not mix with the oil, and appears very much like bubbles of air. Urine and blood fall in drops, and in a leisurely fashion, to the most dependent part, where they collect together. The red colour of blood and the blue of indigo-carmine are readily recognisable, but it is conceivable that if present in sufficient quantity they might easily obscure the lowest part of the bladder wall to the inconvenience of the surgeon. There is no reason, however, why this difficulty should not be overcome by alteration of the position of the patient. At first difficulties were encountered in focusing the image, but it was later recognised that these were largely due to the insufficient filling of the bladder by the paraffin.



Apparatus for injection of paraffin into bladder.

Paraffin was chosen on account of its freedom from nocuous chemical impurities and its almost ideal transparency, but it is not supposed that the paraffin liq. B.P. is ideal. By the courtesy of Messrs. the Silvertown Lubricants Ltd., Silvertown, E.16, there has been an opportunity of testing two samples of paraffin specially prepared for the purpose. Both oils are of low specific gravity, 0·817 and 0·863 respectively. The lighter of the two is of watery consistence, the other rather more viscous; they are odourless, colourless, crystal-clear, and non-irritating to the conjunctiva. They are not combustible when exposed to air at ordinary temperatures. There is little to choose between the two oils, any balance being in favour of the heavier if used at body temperature, but either is more suitable for cystoscopy than the paraffin liq. B.P. Diathermy can be carried out with the electrode submerged in paraffin, and would seem to be a safe procedure in the absence of any quantity of air; attempts to produce ignition of the oil in an enclosed air-containing space have, so far, been unsuccessful. Diathermy through paraffin and in the presence of air in the bladder must, however, be regarded as dangerous until further experiments prove the contrary.

The practice of the method outlined above is beset with difficulties which are not at first apparent and which, with patience, are not insuperable; but it will be remembered that the method was elaborated for use in a limited class of cases where ordinary methods fail.

I am indebted to my chief, Mr. John Clay, and to Mr. Hamilton Drummond for kindly supplying cases to test the method.

Clinical and Laboratory Notes.

A CASE OF MITRAL STENOSIS.

BY DUNCAN LEYS, M.B. OXF., M.R.C.P. LOND.,

HOUSE PHYSICIAN TO PADDINGTON GREEN CHILDREN'S HOSPITAL

THE following case of mitral stenosis in a young boy is of interest in that a complete life-history of the disease was obtained. The striking features of the case were (1) the appearance of definite signs of mitral stenosis within twelve months of the onset of rheumatic infection, and (2) the leading part played by this lesion, as shown during life by the clinical symptoms and cardiac changes, in causing death five years after the first attack.

Rheumatic pains, with arthritis of wrists and ankles, first occurred at the age of 6, in November, 1918. The patient was brought for treatment to Paddington Green Children's Hospital, where he remained for one month, during which time there was no evidence of any heart lesion. Subsequently, there were no rheumatic symptoms until October, 1919, when he was readmitted to hospital with arthritis and tonsillitis: the apex beat was now half an inch outside the nipple, and an apical systolic murmur was present, but during his stay in hospital a diastolic murmur developed which, before his discharge three weeks later, had become a definite presystolic "roughening" leading up to the first sound at the apex. He remained free from symptoms, and no further evidence of re-infection occurred until January, 1923, when—after getting out of bed, where he had lain for three weeks with rheumatic pains—he became breathless and exhausted on any exertion. He was re-admitted to hospital in April, 1923. Rheumatic nodules were present; the pulse was regular, but of very small volume; a presystolic thrill was felt at the apex, and well-marked systolic and presystolic murmurs were heard; after 14 days in hospital he was able to walk about without discomfort and was discharged. The following July found him once more in hospital, with definite signs of heart failure—dyspnœa, cough, cyanosis, and palpable, tender liver. The apex beat, which was regarded as a right ventricle impulse, remained in the fifth space, half an inch outside the nipple, and percussion showed extension of the heart dullness to right of the sternum: 18 days later he was again walking without distress, and was seen shortly afterwards bathing in the Regent's Canal.

At the beginning of October, 1923, he was brought to the hospital with symptoms of heart failure. The respirations were 40 to the minute, temperature 104° F., pulse 140—regular and of very small volume: the heart's impulse extended out to the axillary border, and the presystolic murmur alone was heard, with a banging second pulmonary sound. After 14 days in bed he was able to get up, but the next day coughed up a little blood: a week later a hæmoptysis of half a pint took place; at this time there was no œdema, nor was the liver enlarged. For the next few days the temperature ranged from 100° in the morning to

103°–104° in the evening; there were signs of bronchitis, and over a small area above the liver, where he complained of pain, a pleural rub and, later, tubular breathing were heard. On the fourth and sixth days hæmoptyses of half a pint occurred, but œdema did not appear until the end of the next week, during which time occasional vomiting and slight hæmoptyses took place; the measure of urine began to decrease, but specimens remained free of albumin; the pulse was small, rapid, and regular. The following days, which preceded death, were marked by irregular pyrexia—probably due to the bronchitis and pneumonic condition—and by a gradual stasis of the systemic circulation, progressive œdema of extremities and scrotum, ascites, and great engorgement of the liver.

Post mortem, there was an excess of fluid in the pericardium, but no adhesions; the right auricle and ventricle were very much dilated and hypertrophied, occupying the whole front of the heart; the left auricle widely dilated, the left ventricle small, with healthy muscle (microscopical examination showed no evidence of myocarditis). The mitral valve showed extreme stenosis (scarcely admitting the tip of the little finger), the flaps were adherent to each other, a mass of fibrous tissue, and the chordæ tendineæ much shortened. Recent vegetations were seen on the margin of the narrowed mitral orifice, on the dilated tricuspid, and on the aortic cusps, but, apart from the mitral, there were no signs of old valvular disease. In the lungs the right middle lobe showed pneumonic consolidation; elsewhere there were numerous areas of collapse, and a few doubtful infarctions of small size, but no signs of recent or old pleurisy. There were no infarctions in the spleen or kidneys.

The cause of death in cardiac disease during childhood is usually identified with failure of the left ventricle, due to myocarditis or mechanical defect from adherent pericardium, aortic or mitral regurgitation, &c. In this case, however, the fault appeared to lie in the inability of the rest of the heart to supply the left ventricle with enough blood to maintain the circulation; this was due to a degree of stenosis in the mitral valve which would have been remarkable even in an adult heart, and was evidenced clinically by the persistently small, rapid pulse, and by the gross embarrassment of the pulmonary circulation (the boy coughed up more than half a pint of blood on three separate occasions within one week, at a time when signs of stasis in the systemic circulation were lacking).

My thanks are due to Dr. G. A. Sutherland, whose case it was, for the opportunity of recording it.

TWO UNUSUAL CASES OF INTESTINAL OBSTRUCTION.

BY CECIL P. G. WAKELEY, F.R.C.S. ENG.,
ASSISTANT SURGEON AND TEACHER OF CLINICAL SURGERY, KING'S COLLEGE HOSPITAL.

AXIAL rotation, or torsion of the pedicle, of an ovarian cyst occurs in about 2 per cent. of cases which come to operation, and this phenomenon takes place more commonly with cystic than with solid tumours. Axial rotation is met with most frequently during pregnancy and in the puerperium, but rarely gives rise to intestinal obstruction.

CASE 1.—Patient, aged 72, was admitted to King's College Hospital, June 21st, 1923, with signs of intestinal obstruction. The patient stated that two days before admission to hospital she was seized with acute pain in the abdomen and vomited several times. On admission to hospital her temperature was 98·4° F., pulse 72, and respirations 24. The abdomen was very distended, except in the flanks, and visible peristalsis was evident. A hard painful tumour could be palpated in the right iliac fossa. The obstruction was thought to be due to the tumour pressing on the lower part of the ileum, as the signs all pointed to an obstruction in the small intestine.

Operation.—Laparotomy was performed through a right paramedial incision. The small intestine was very distended. The obstruction was found to be due to a twisted ovarian cyst which was almost black in colour, adherent to the medial side of the cæcum and completely occluding the ileo-cæcal valve. The cyst, which was the size of a large orange, was carefully dissected off the cæcum and removed, together with the right Fallopian tube, which was also very congested. As soon as the obstruction to the ileo-cæcal valve was removed, the gaseous intestinal contents moved into the cæcum and ascending colon.

The wound healed well, and the patient left hospital ten days after the operation. The cyst on microscopical examination proved to be teratoma.

CASE 2.—Patient, aged 73, was admitted to King's College Hospital, Nov. 20th, 1923, with the following history. Three days earlier she was seized with acute pain in the lower part of the abdomen, which was followed by vomiting on two occasions. Previously she had enjoyed good health. On admission the temperature was 97·6° F., pulse 100, and respirations 28. The abdomen was distended; there was no rigidity, but there was some tenderness in the right iliac fossa. A bilateral swelling was found in the hypogastrium bigger on the left side than on the right. The swellings were distinct and well defined. There was no free fluid in the abdomen. Per vaginam the swelling on the left side was found to be fixed in the pelvis.

Operation.—Laparotomy was performed through a paramedial incision; two ovarian cysts were found. That arising from the left ovary was a pseudo-mucinous cyst, the pedicle of which was twisted through two and a half turns: it was found to be impacted in the pelvis. With difficulty the cyst was elevated from the pelvis and removed. The cyst of the right ovary was a dermoid; it had undergone axial rotation and was very congested and adherent to the medial aspect of the cæcum, causing obstruction to the ileo-cæcal valve. It was removed with the right Fallopian tube. The abdomen was closed without drainage. The dermoid cyst on section contained pus.

The patient made excellent progress for the first week, but then died suddenly from pulmonary embolism.

It will be noticed that in both the cases recorded the patients were over 70 years of age, and in each case the intestinal obstruction was caused through adhesions between a twisted teratomatous ovarian cyst and the cæcum.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

GRADING OF THE POPULATION FROM THE POINT OF VIEW OF PHYSICAL FITNESS.

A SPECIAL meeting of this Society was held on Jan. 21st at 1, Wimpole-street, W., Sir WILLIAM HALE-WHITE, the President, in the chair.

Air-Commodore DAVID MUNRO, in opening a discussion on this subject, said it was complex and far-reaching, being mixed up with fundamental, social, economic, and political problems, some of which had been subjected to close study by the best brains in the medical profession. The late war had shown the physical state of our manhood to be far below what the average man thought it to be. The war-time pronouncement of a well-known politician, who declared "We are a C 3 people," was untrue for certain classes of the population, but for other classes it was pretty well agreed to be true. Thus, while miners and agricultural labourers were found to have a high index of physical fitness, as judged by Keith's standard, those engaged in sedentary industrial occupations were found to have a low index. The report issued by the Ministry of National Service upon the physical examination of men of military age by National Service Medical Boards was the most comprehensive survey that had yet been attempted on the health and physique of a large portion of the population. Records of some 2½ million examinations carried out on men between the ages of 18 to 45 were analysed. To quote the words of the report:—

> As the result of this analysis the conclusions come to were that of every nine men of military age in Great Britain on the average *three* were perfectly fit and healthy; *two* were upon a definitely infirm plane of health and strength whether from some disability or from some failure in development; *three* were incapable of undergoing more than a very moderate degree of physical exertion and could almost—in view of their age—with justice be described as physical wrecks, and the remaining man was a chronic invalid with a precarious hold on life.

As matters had existed in the past only the stress of a great national struggle could have brought into existence, and caused to function, the machinery for

conducting such a number of medical examinations, and for analysing their results, and it might well be wondered what practical possibility there was in peace-time of obtaining records to show the state of physical fitness of any large section of the population and, if obtained, to what practical use they could be put. He would endeavour to give a sketch of (*a*) the value of such records, if obtained; (*b*) the amount of information necessary to be recorded: (*c*) the possible method of obtaining and recording it.

Value of Records and Amount Required.

The picture presented would indicate the directions in which efforts should be made to improve health generally, and as such the figures would be of great value to the Ministry of Health.

To the physical culture teachers these figures would be of value in giving them a picture of the different classes. Figures of this kind, giving information of the *fit* classes of the population, would undoubtedly be useful in the future in the consideration of eugenic problems, for one could not forecast what influence Malthusian and neo-Malthusian doctrines might have on future policies. Information of value to industrial psychologists would be obtained. Physical fitness was a quality not capable of precise measurement. There were, it was true, certain qualities capable of exact measurement, such as height, weight, and girth of chest. Sir Arthur Keith's standard, as he (the speaker) understood it, was based on such measurements—in fact, on height measurements. But while physical qualities lent themselves to exact measurement physical disabilities unfortunately did not. To refer again to words in the report already quoted:—

> To give an exact percentage value to every known disability would present insuperable difficulties in practice. The health of individuals and of each of their component structures and organs shades off gradually, and often almost insensibly, into disease, which in its turn exhibits varying degrees of intensity which are not sharply defined from each other, and react differently on different individuals. The medical interpretation of objective clinical phenomena does not, and cannot, led itself to expression in figures.

The borderland of disease was still largely unexplored. What, then, was it necessary to do in the way of getting data about physical fitness? He believed that certain of the tests in use in the Royal Air Force, for assessment of the physical fitness of air pilots, gave results capable of numerical expression, and yielding extensive information as to the state of health of the individual tested. According to the periodic results of these tests, supplemented by a record of observed physical disabilities, he felt that individuals *might* be classified from a health point of view. The tests he would describe gave no results indicating in the subjects any special aptitude for special employments, and therefore, from the point of view of the industrial psychologist, they would be valuable in picking out the man who was physically and mentally fit for arduous work, but not the man likely to become a skilled manipulator. For these accessory tests—such as reaction-time tests—would need be employed. He would prefer to use the words "physical and mental endurance" rather than "physical fitness"—meaning that state of health which made a man able to perform an act of physical exertion not once or for a short time but repeatedly over a long period of time without undue physical or nervous stress This was a state of health which required personal care and preparation with a view to that end. Even then, every man had his breaking-point, and the fit man was the man whose breaking-point takes longest to supervene. These particular tests were originated after examination of men who had manifested such endurance—viz., star-turn pilots. The tests which he would suggest were (1) the "endurance" or mercury U-tube test, and (2) the response of pulse to exercise, or exercise-tolerance test.

The Endurance Test.

This test was performed as follows. With the nose clipped, the subject was asked to empty the lungs completely, inhale fully, blow the mercury in this tube to 40 mm., and maintain it there without breathing for as long as possible, the pulse being counted in periods of five seconds during the performance of the test. The average time of holding up the mercury in a large number of cases tested was between 50 and 60 seconds. The pulse-rate should remain steady or rise gradually according to the time the breath was held. A marked rise was unsatisfactory, and a still more unsatisfactory sign of cardio-motor instability was a marked rise during the second or third period of five seconds, followed by a dying away to normal or below normal. For the detailed physiological explanation of the phenomena of this test he would refer them to its inventor, Group-Captain Martin Flack. The factors involved were, as he understood them, (1) the state of oxygenation of the patient's blood; (2) the state of his respiratory efficiency; (3) the tone of his blood-vessels. Whatever was the actual physiological machinery functioning in this test, empirically it had proved of great value to the R.A.F. as an indication of a man's capability for physical endurance. So far it had only been used for testing flying personnel, but he anticipated its general use in recruiting centres for all personnel at no very distant date. He also anticipated that a U-tube manometer would in the future be as much a part of the equipment of a general practitioner as is a stethoscope.

Response of Pulse to Exercise Test.

The pulse-rate was taken with the subject sitting down and the total number of beats in 60 seconds recorded. If the pulse was unsteady it was counted in periods of five seconds until the minimum constant rate was obtained. The subject was then directed to stand up, and the number of beats recorded in the first five seconds multiplied by 12 was recorded as the rate per minute for the standing-up pulse. With the subject still standing the examiner then recorded the lowest steady rate to which the pulse fell. Regulated exercise was then carried out by the subject placing one foot on a chair and standing alternately on the floor and on the chair five times in 15 seconds, the speed being regulated by the examiner raising and lowering the subject's wrist in every three seconds. At the end of the 15 seconds the pulse was counted in periods of five seconds—the time which it required to fall to its steady rate being recorded in addition to the rate per minute in the first five seconds after exercise. A typical numerical record of this test in a fit man would be (*a*) sitting 72, standing 84–72, after exercise 96; (*b*) time of return to normal standing rate, 20 seconds. This test was made five times up and down only on the chair because at the time several hundred men were being examined each day. A pulse which rose rapidly on standing and took some time—e.g., 1–2 minutes—to return to its lowest steady rate indicated probably poor splanchnic vaso-motor control—in such cases the pulse maintained its quicker rate during standing. If the time of return to normal after exercise exceeds 30 seconds it was suggestive of cardiovascular insufficiency or of nervous instability. Further, this test tended to differentiate between true and false tachycardias and to throw light on various disordered actions of the heart, of which one heard so much during the war. Possibly, also, it would assist in assessing the seriousness or otherwise of valvular lesions as expressed in terms of "bruits." To sum up—these two tests were simple in application; their results could be expressed numerically and used for health classification purposes; they could also be easily codified for statistical purposes; apart from gross disabilities and special qualifications such as vision, they gave a good indication of general neuro-muscular and constitutional tone at the time of examination. The standards of fitness in the R.A.F. were set by the examination of individuals who had successfully withstood considerable physical and nervous strain in contra-distinction to those who had broken down; the psychological element in the endurance test was, he thought, of real value as a measure of the mental

"make up" (the report of the Shell Shock Committee brought out very clearly the previous lack of attention to mental standards in the course of medical examinations); the tests would be valuable as a comparative test of fitness employed periodically, and he would suggest their use to safeguard the public in those occupations in which the element of public safety is involved—e.g., motor drivers, tram drivers, locomotive engine drivers, railway signalmen, factory machine operators, mercantile marine navigators, civilian air pilots; lastly, where employed up to date on a small scale they have given consistent results. The chief disadvantage of the tests was that temporary toxæmias upset them—mild influenza or even a heavy cold was sufficient to cause remarkable deterioration in results—hence the value of successive records. Also, of course, they gave no information about specific disabilities.

Possible Methods of Obtaining and Recording Data.

In the Services the obtaining of information was easy. If medical information was asked for, the statistics compiled from the forms rendered constituted the basis of future medical policy—though no one who filled up the forms ever believed it. If the filling up of forms was resented in the Services, in civil life it was hardly even tolerated; it would be quite impracticable to attempt to conduct any examinations annually on every man, woman, and child of the population—not only because of the difficulty in setting up the agency but also from the point of view of expense. Whatever agency were employed the coöperation of the Medical Research Council would be essential. However it might be done, he felt that some time or other some system of health classification of the population would be established.

The Government Commission.

Sir ARTHUR KEITH dated his own interest in the question of the physical fitness of the population from the appointment, in 1903 or 1904, of a Government Commission to inquire into it. The Anthropological Society had at that time suggested machinery for such an inquiry. Later, during the war, he became a member of the Committee appointed to advise the Ministry of National Service concerning the grading of recruits. With regard to the percentage of the really fit in any normal population, he did not use the data quite as had been stated. An infinite number of factors had to be considered, but it was found that of a thousand men from a part of the country with a good physical standard, 700 could be placed in grade 1, 200 in grade 2, and the remainder left over; in other parts of the country the figures were very different. The standard they had suggested had been formulated for the guidance of medical officers. At present it was no longer a matter of compulsory service, and recruits could be chosen by more exacting standards. Formerly the standard was purely that of physical appearance, weight, &c.; but these factors might fail. He considered that Group Captain Flack's work marked a great advance in methods of examination upon anything hitherto done in any country. We were seeing an extension of the movement perhaps introduced by Sir James Mackenzie—namely, the consideration of the manner in which an organ worked, the physiological method of classifying men.

Sir DUNCAN RHIND, speaking from the layman's point of view, recalled his experiences in gathering the statistics upon which the report of the Ministry of National Service was based. It was sometimes said that the National Service examinations carried out during the last year of the war were not indicative of the true state of the national health, but the fact remained that year by year there was a very large number of men called up and found unfit for any form of service. The percentage of the unfit, extending to the youths of 18, was much greater than it should have been. It would be very difficult to introduce tests on which estimates of man power could be based, but if it were possible, such tests as had been described were what was required.

The Examination of Recruits.

Dr. WILLIAM FITZGERALD said that he could perhaps speak with some little force on the question under discussion, for during the war he had been engaged solely in the examination of recruits at Liverpool. Under the Ministry of National Service alone his medical board had dealt with some 30,000 recruits, and he had previously served on the much-maligned War Office boards; even the latter, when left alone, could only find some 30 per cent. of recruits fit for general service. To a certain extent they were dealing with a residual population under the Ministry of National Service; the boys of 18 were particularly disappointing, in a great measure because they were suffering from conditions of the feet, tonsils, ears, nose, &c., which if treated earlier in life would have been remediable. The tests described by Air-Commodore Munro were most valuable; they could not replace sound clinical examination, but formed a useful adjunct. He failed to see how such medical examinations could be brought into being in this country, and referred to an instance in one of our Colonies showing how organised labour would object to them. Practically nothing had been done to remedy the state of affairs disclosed by the report of the Ministry of National Service. He had visited the slums of Liverpool on Saturdays and Sundays during the war, and had learned what they meant from the point of view of national health.

Group-Captain MARTIN FLACK explained that the tests referred to were designed solely as adjuncts to general physical examination. They were perhaps empirical, being set on subjects who had endured stress, but they seemed to show the importance of the efficiency of the controlling centres of respiration and circulation. A man who lacked good respiratory efficiency, and whose blood was not well arterialised, would quickly show signs of discomfort when breathing into a bag, giving up in under two minutes, whilst a healthier man might go on for five minutes or more. The unfit were hypersensitive to lack of oxygen. Marked respiratory inefficiency tended to be associated with laxity of the trunk muscles and pooling in the venous reservoirs, rendering the subject unable to respond to effort as the fit man was able to do.

The Tests of Efficiency.

Sir THOMAS LEWIS said that he had been out of touch with the questions under discussion since 1919, and had been particularly interested to hear about the tests of efficiency. He agreed that if they were used to test the fitness of large numbers of people, those chosen for the purpose would soon object. Examination was, however, possible in the case of men who claimed pensions. Exercise tests could not replace or be replaced by clinical examination. Men with valvular heart trouble were frequently found to tolerate exercise well; again, others who showed no signs of such trouble had poor tolerance of exercise. The tests must approximate to the forms of exercise they were intended to represent; many persons who could pass the chair test would fail if exercise were pressed further. The chair test was originally put out with some emphasis on the resulting pulse-rate, and there had arisen a tendency on the part of officers of medical boards to rely almost wholly on the reaction of the rate of the heart. It became almost a rule of thumb method, and was then misleading, since many men who showed a normal heart reaction soon displayed respiratory distress. Again, exhaustion might soon develop, the subject becoming unsteady on his feet, &c. The only really crucial test was the thing itself—to put men into the front line and see how they stood it. The individual test, again, might suit one man much better than another; a man should be put to his own work. He suggested a probational period for recruits, which, if not necessary now, might be useful in event of another problem like that of 1914. He wished to know if the mercury test had been employed mainly on young men or on men in the 'forties, who could not be expected to give the same reactions to the test.

Sir ARTHUR KEITH interpolated a few words to the effect that he had supported the idea of a probational period of a month or two months for recruits during the war.

Dr. F. W. COLLINGWOOD asked whether it would not be possible to include some test of character when examining recruits. In medical examinations for the Navy years before he had found men who passed all the tests and later showed an inability to submit to reasonable discipline.

Dr. G. H. HUNT wished to know the relative importance attached by Air-Commodore Munro to the mercury and exercise-tolerance tests. He had himself had experience with students, and had found the mercury test open to misinterpretation. He had also found the vital capacity test extremely fallacious; a very poor reaction had been given by a Rugby international player.

Colonel SYLVESTER BRADLEY said he had come to the conclusion that the exercise test was of value not as showing the amount of exercise the individual could perform, but as indicative of the latter's nervous stability. He pointed out that the period spent by the recruit at a depôt was a probationary period. Recruiting statistics were of interest as showing the alteration of incidence of various conditions such as varicose veins, which were apparently decreasing, and conditions apparently on the increase, such as flat-foot and middle-ear disease.

The PRESIDENT, speaking of his experience on the Appeal Board during the war, and as officer in charge of a hospital, remarked on the light-hearted way in which many recruiting officers treated nervous instability, particularly epilepsy, and on the harm and waste of public money this occasioned.

Reply.

Air-Commodore MUNRO, replying, said that the discussion had not developed as he had intended; he had approached it with a civil rather than a military mind. He had hoped for enlightenment as to the machinery by which examination of the population might be undertaken. He agreed that the point of the tests must be—does the man do the job? The tests he had instanced were used for flying, where the man could not be put to the work before examination. In answer to Sir Thomas Lewis's question, the tests were performed chiefly on young men, but also on every R.A.F. officer once a year, and before he was sent overseas. No marked deterioration with increasing age had been observed, but the examinations had not been carried out for a sufficient number of years for an answer to be given with confidence.

In answer to Dr. Hunt, he would point out that in any case the tests only provided bits of evidence, and could not be relied upon to the exclusion of general examination.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Jan. 16th, Sir DAVID WALLACE, the President, being in the chair.

Dr. J. S. FRASER gave a communication on

Septic Otitic Thrombosis of the Cranial Blood Sinuses and Jugular Bulb,

being an analysis of 28 consecutive cases operated on between 1907 and 1923 inclusive. He said that septic sinus thrombosis was relatively more common in acute than in chronic cases of middle-ear disease. As regards sex- and age-incidence, males were more numerous than females, and 19 of the 28 cases occurred in the first two decades. A history of aural discharge commencing after measles or scarlet fever was obtained in seven cases. Only one of the cases was operated on in private practice. Dr. Fraser regarded rigors as the most important symptom from the point of view of differential diagnosis. A rigor might occur in the initial stages of brain abscess or meningitis, but recurring rigors were only found in septic venous thrombosis. The hectic temperature was typical; that of meningitis being continuous, whilst in cases of brain abscess after the initial rigor it was usually subnormal. In all cases of middle-ear suppuration associated with evening pyrexia he held that the sinus should be exposed and examined. In contrast with cases of brain abscess and meningitis, the patient usually was mentally bright and felt well. Vomiting and giddiness were present in about half the chronic cases, but in these there were complications, such as labyrinthitis, meningitis, or brain abscess. Mastoid tenderness was by no means constant. Otoscopy was usually rendered difficult by discharges and cholesteatoma. A dry tongue, showing brownish fur in the centre, was frequently noticed. Blood cultures had not proved of great diagnostic service. Dr. Fraser went on to speak of the findings at operation in the seven acute cases. Pus in the antrum and cells was present in all. Four cases showed bacteriologically a pure growth; two of streptococcus, one of diphtheroid bacillus, and one of an organism closely resembling *B. influenzæ*. In the remaining three the infection was mixed. An extradural peri-sinus abscess was present in only three. A peri-sinus abscess alone may cause evening pyrexia. In deciding whether to open the sinus, the condition of the wall is important. If this shows reddish purple, so-called "healthy" granulations, draining of the abscess may suffice; otherwise the sinus must be opened and the clot turned out. In only one case was there intracranial complication—purulent meningitis. Metastatic abscesses occurred in three of the seven cases, five recovered, and two died. Only one had an uninterrupted recovery. Both of the fatal cases developed empyema. In the 21 chronic cases cholesteatoma with or without pus was present in 15. Of 15 investigated bacteriologically seven showed pure cultures, eight mixed infection. Peri-sinus abscess was present in 14. Complications were more frequent in these cases. Eight cases had labyrinthitis, four had purulent meningitis on admission, five developed it later; four cases had brain abscess. In several cases more than one complication was present. Only four showed metastatic abscesses. Of the 11 uncomplicated cases nine recovered and two died. Of the ten complicated cases four recovered and six died. Only four of the successful cases showed uninterrupted recovery. In the eight fatal cases septic thrombosis beyond the point of operation was found. In these cases septic infarcts in the lung with empyema were present. In only one case was there septic infarction with empyema in which the blood sinuses seemed healthy. In one case death was caused by meningitis alone, and in two there was, in addition, abscess of the temporal lobe. The paper was followed by a lantern demonstration.

In the subsequent discussion the PRESIDENT, Dr. LOGAN TURNER, Dr. D. J. GUTHRIE, Dr. G. E. MARTIN, Prof. EDWIN BRAMWELL, and Dr. W. T. GARDINER took part.

Dr. CHALMERS WATSON gave a communication on

Alimentary Sepsis from the Practitioner's Point of View.

He referred to the work of Metchnikoff, J. G. Adami, Arbuthnot Lane, and others, spoke of the rôle of alimentary sepsis in present-day surgery, and discussed the possibility of the ætiological importance of intestinal subinfection, as suggested by Adami and others, in many common diseases. He regretted the nomenclature used in many diseases, stigmatising as mere labels many of the terms used. So-called anatomical diagnoses were often very misleading. He dwelt on the importance of two ætiological factors in disease—heredity and strain or stress. In the term strain he included the different forms of medical sepsis, as revealed clinically by (*a*) oral sepsis, (*b*) the condition of the urine, and (*c*) the state of the bowels, as determined by simple clinical methods of examination. With these three points in

view he had had examined 11 patients with various complaints, occupying the beds on one side of his ward in the infirmary. In all cases dental sepsis was present, none of the patients being healthily supplied in quantity or quality of teeth. Bacteriuria was present in all the cases, and the examination of the second of two colon wash-outs, which should normally be clear and fairly free from micro-organisms, showed in all cases turbidity and marked infection. He made reference to the intestinal flora in health and disease, and pointed out some of the fallacies of the usual teaching in this matter, concluding with some remarks on treatment.

Exhibition of Cases and Specimens.

MR. J. W. DOWDEN and Dr. MORRISON showed a case of fracture of the second, third, and fourth phalanges and division of the extensor tendons of the hand after operation and treatment by early active movement. After seven weeks there was full extension of the first and second fingers, fair extension of the third and fourth, and full strong flexion of all four fingers.

Dr. W. A. ALEXANDER showed three specimens illustrating unusual causes of intestinal obstruction.

Reviews and Notices of Books.

ESSENTIALS OF ORAL SURGERY.

By V. P. BLAIR, A.M., M.D., F.A.C.S., and R. H. IVY, M.D., D.D.S., F.A.C.S. London: Henry Kimpton. 1923. Pp. 526. 32*s*.

THIS book has been written primarily for the dental student. The major operations receive brief mention, but the lesser surgical procedures which come within the scope of the dentist, as apart from the oral surgeon, are fully described. The recognition of surgical conditions receives full attention, for the dentist should be competent to recognise them even though he does not undertake their treatment. Much of the material is taken from the well-known text-book by Dr. Blair on the Surgery and Diseases of the Mouth and Jaws, but there is a good deal of fresh matter on fractures of the jaws, root resection, operations for cysts, and anæsthesia. One of the best features of the book is the account of fractures of the jaw, which embodies some novel methods of treatment. The authors advocate wiring as the routine treatment for most fractures of the mandible. By this they do not mean fixation by a wire passed through the body of the jaw, but fixation by wire ligatures twisted round the necks of the teeth and drawn tight. In this way the displacement is reduced and a perfect occlusion maintained. The mouth is of necessity kept closed, but apparently this does not involve any marked degree of discomfort to the patient, though the diet must be of a liquid nature. The method is not likely to supplant the metal cap splint, which has the great advantage of immobilising the fragments and allowing the mouth to be freely used, but it has one striking merit. The materials used to fix the fracture are simple, and in the possession of every practitioner. Brass binding wire, such as can be procured from any ironmonger, artery forceps, short scissors, and towel clips represent all that is needed, whereas any other form of apparatus requires, to be effective, the equipment and resources of the dentist. The surgeon who attempted to treat a fracture of the jaw without calling in the aid of a dentist would be unwise, but under conditions in which dental aid was not available this method should prove useful, and might well find a place in text-books of surgery. There is a good account of root resection, and though the authors are cautious as to the final results of this once popular operation, they allow it a modest sphere of utility. On p. 200 we are told that foot-and-mouth disease is caused by the bacillus of Siegel, a statement which is at least premature. There are few references to other authorities, and this omission might well be remedied in future editions.

The authors have produced a useful book, which ranks among the best of its kind, and should prove equally serviceable to dentist and surgeon.

CLINICAL MEMORANDA FOR GENERAL PRACTITIONERS. Second edition. By ALEX. THEODORE BRAND, M.D., C.M., V.D., and JOHN ROBERT KEITH, M.D., C.M., Medical Officers, Driffield Cottage Hospital. London: Baillière, Tindall and Cox. 1923. Pp. 375. 7*s*. 6*d*.

THIS is a carefully compiled record of clinical experience. Certain aspects of disease which get too little recognition in practice are emphasised. These include the importance of arterial spasm in such complaints as migraine and functional paralysis, and hyperæsthesia of the skin as a physical sign in organic disease. The possibility of counter-irritation of the vagus nerve in the many diseases in which it is or may be concerned—Graves's disease, pertussis, and spasmodic asthma—is an attractive subject. Muscular overstrain as a common cause of so-called rheumatism, Bier's methods of passive hyperæmia, and the value of yeast in septic conditions are also dealt with at unusual length. There is a useful contribution on the much neglected subject of incompatibility of drugs, and a larger one on the use of individual drugs which should be of considerable interest.

Certain rules here set out we cannot altogether recommend to the junior commencing practice, to whom the preface is partly addressed; in appendicitis, for instance, Abram's sign, in which the tenderness over McBurney's point is found to disappear when the skin over the seventh dorsal vertebra is frozen with ethyl chloride, will hardly prove of value; and to lay down that "if at the end of 48 hours the symptoms have not improved operation is indicated," is surely rather understating the case in favour of appendix abscess. Of the collection of aphorisms with which the book ends, it may be said that since most rules in medicine admit of 50 per cent. exception, they must be received with some caution. Nevertheless, this type of book is only too rare. If there were more coöperation between medical men in general practice, whose splendid opportunities for observation could thus be extended over ten times their present field, we might look forward to many similar useful contributions to the symptomatology and therapeutics of disease.

PRACTICAL ANÆSTHETICS.

Third edition. By H. EDMUND G. BOYLE, M.R.C.S., L.R.C.P. Lond.; and C. LANGTON HEWER, M.B., B.S. Lond. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. With illustrations. Pp. 187. 6*s*. 6*d*.

THIS book is much altered in the present edition. The most striking feature of the authors' tendencies in practice is their addiction to complicated methods and apparatus in preference to simple measures. It is very likely true that the best possible results are only to be obtained in certain cases through the use of these elaborations in the hands of experts, but we greatly doubt the wisdom of recommending them as first choice in a book intended for students and practitioners who are not specialists in anæsthetics. Take, for example, this recommendation from page 163: "Endo-tracheal anæsthesia . . . should always be employed in cases of strangulated hernia, intussusception, &c., where intestinal obstruction has occurred." We doubt whether most authorities would support this advice even if the anæsthetic is in expert hands. It can be of little service to the practitioner who often has to give anæsthetics in cases of this description, and who is very unlikely to possess, still less to be able to use, an endo-tracheal apparatus. A new chapter by Dr. E. J. McKesson gives clearly this authority's views on pulse-rate and blood pressure during anæsthesia, and their significance as regards shock, and the prospect of recovery therefrom. The frequent readings that he advises would have, no

doubt, great educational value when carried out in the hospital operating-theatre by students learning anæsthetics. With regard to pulmonary after-effects, the authors state it to have been shown that "most cases of post-operative bronchitis are embolic in origin." As the true origin of these post-anæsthetic complications is such an interesting and controversial question, the reference here would have been welcome. The authors are warm supporters of ethanesal, but, nevertheless, they should have given a place to Dr. H. H. Dale's criticism of the work, both of Cotton and Mackenzie Wallis, if the book went to press after Dale's paper was published.

The book is excellently produced, is easy to read, and has much of interest to the specialist in anæsthetics.

EMERGENCY OPERATIONS FOR GENERAL PRACTITIONERS.

By H. C. ORRIN, O.B.E., F.R.C.S. Edin., Surgeon, Ministry of Pensions Orthopædic Hospital, Newcastle-on-Tyne; late Civil Surgeon to the Third London General Hospital. London: Baillière, Tindall and Cox. 1923. Pp. 1065. 15*s*.

THE motives of the author in writing this book as set forth in the preface are much to be commended, but the execution of his plan leaves something to be desired. Any practitioner may find himself in such circumstances that an emergency operation, performed by himself, offers the only chance of life for his patient. Then he needs every help that can be given him and the most elementary facts of technique should be easily available. The experienced surgeon is apt to forget that what is so familiar to him as to appear unnecessary for mention may be of great importance to the unaccustomed operator. Instructions as how to find the cæcum in appendicitis operations, or where to look for the perforated gastric ulcer, or how to detect the viability of strangulated intestine have been omitted in this work, and the oversight is regrettable. The subject of intra-abdominal traumatic hæmorrhage is not treated, so that splenectomy is not described; under strangulated hernia the operator is instructed under certain conditions to resect and do an end-to-end anastomosis, but no account of this operation appears. Some recommendations are against the best teaching, for example, the use of nails or "other fixation medium" in compound fractures. On page 11 there is a serious printer's error, where the injection of 3½ oz. of 5 per cent. novocaine is said to be safe.

The inexperienced surgeon is not likely to get the help he wants from this book.

DISEASES OF THE SKIN AND THE ERUPTIVE FEVERS.

Fourth edition. By JAY FRANK SCHAMBERG, A.B., M.D., Professor of Dermatology and Syphilis, University of Pennsylvania. London and Philadelphia: W. B. Saunders Company. Pp. 626. 25*s*.

Dr. Schamberg's book is by some considered to be one of the best of the smaller text-books of dermatology, and is exceptional in that it contains a detailed account of the eruptive fevers and the cutaneous complications of vaccination. This edition has been revised thoroughly, and the section on the treatment of syphilis entirely rewritten. The actual subject-matter is, on the whole, clearly written, and the sections dealing with differential diagnosis, in which the main points are often tabulated, are usually adequate. The directions for treatment form one of the best features of the book, and several useful formulæ are given. On the other hand, as a corollary of the irrational classification adopted, the sections on ætiology are for the most part unsatisfactory and often far from being up to date. Much confusion still seems to exist, even in the minds of expert dermatologists, concerning the so-called seborrhœic eruptions. In this book we find seborrhœic eczema, acne, sycosis, furunculosis, and carbuncle dealt with in the section on inflammations, although they are not considered together but are separated by other conditions with an entirely different ætiology; we find the seborrhœic form of alopecia described in the section on atrophies, and we find seborrhœa among anomalies of secretions of glands. The author still describes pityriasis simplex as "seborrhœa sicca," which is a contradiction in terms, and he does not even mention the so-called "bottle-bacillus." Seborrhœa and the seborrhœic eruptions are easily understood if considered in an intelligent manner according to their ætiology, and the confusion that has arisen concerning them is unnecessary and is now inexcusable. In the description of alopecia areata, the statement is made that "Sabouraud regards his microbacillus as the probable cause of alopecia areata." As a matter of fact, he abandoned this view years ago, and made a formal statement to that effect at the International Congress of Dermatology in London in 1913. No reference is made to his recent writings on this disease.

The author classifies epitheliomata of the skin into superficial, deep, and papillary varieties, but on what basis this classification is made is not clear. By the "superficial" type he appears to mean basal-celled growths, by the "deep" type tquamous-celled carcinoma; the "papillary" epishelioma "may develop from the superficial or deep variety or from an ordinary wart." No clear differentiation is made between basal-celled and squamous-celled growths as regards their histological characteristics, their prognosis, and their treatment, and the histological description is inadequate. The very superficial, multiple form of basal-celled epithelioma is not described, nor is Bowen's precancerous dermatosis mentioned; there is, however, an illustration labelled "keratosis senilis, a precarious (*sic*) condition of the skin." Satisfactory classification of diseases of the skin is impossible until we know the actual cause of every one, but our knowledge is sufficient to warrant the adoption of a more rational arrangement than is found in this book, though it is right to say that many other text-books are open to similar criticism. Under the heading of "exsudationes-inflammations" Dr. Schamberg classes together a large number of diseases, many of which have nothing in common as regards their ætiology and pathology; moreover, some can hardly be regarded even as primarily inflammatory. What possible reason, for example, can be given for including in the same section eczema, lichen planus, lichen scrofulosorum, acne, psoriasis, gangrene, the various types of ringworm, scabies and eruptions caused by other animal parasites? How can tinea versicolor or ordinary scalp ringworm be considered as inflammatory? It is inconsistent to put lentigo and chloasma in the group of "hypertrophies" and vitiligo in that of "atrophies"; and to include leptothrix, piedra, and plica polonica in the latter group is surely ludicrous. Lastly, we find lupus erythematosus, syphilis, tuberculosis, leprosy, sporotrichosis, and actinomycosis classed as new growths. Such a slipshod method of arrangement detracts materially from the value of a systematic work.

The best part of the book is that dealing with the acute eruptive fevers; this occupies nearly a quarter of the whole volume, and the eruptions and symptoms of the various diseases are described in great detail. To small-pox alone 45 pages are given, and the illustrative photographs are really excellent, as, indeed, they are throughout. But it seems to us that the author would be better advised either to enlarge the volume, so as to bring the level of the purely dermatological part up to that of the section on the exanthemata, or to publish the latter separately.

JOURNALS.

BRAIN. Vol. XLVI., Part II.—On Hepato-lenticular Degeneration, by Geoffrey Hadfield. Description of a case illustrating conclusively the existence of transition types between Wilson's disease and pseudo-sclerosis. Besides lesions of the putamen and the liver, there were focal lesions in the cerebral cortex,

characterised by prolific vascular new formation.—Rhythmical Convergence Spasm of the Eyes in a Case of Tumour of the Pineal Gland, by J. R. De Monchy. Besides the rhythmical spasm, there were found Argyll Robertson's sign, lymphocytosis of the cerebro-spinal fluid, and dystrophia adiposo-genitalis.—The Influence of the Cerebrum and Cerebellum on Extensor Rigidity, by W. P. Warner and J. M. D. Olmsted. Using cats for their experiment, the authors endeavoured to discover the exact location of the pathway from the cerebrum inhibiting tonic extensor activity. From the frontal lobe the tract passes through the mesial part of the internal capsule and below the level of the anterior corpora quadrigemina; in the greater part it then crosses to the other side of the brain stem to enter the cerebellum by way of the middle cerebellar peduncle.—The Sensory Activities of the Skin for Touch and Temperature, by David Waterston. Different thicknesses of skin were removed by blister, and it was found that when a distinct film of epithelium was left touch could be felt, but when more is removed, so that the surface is raw, no tactile sensation can be elicited. The author infers that the epithelium of the skin is the receptor organ for the sensation of touch. As a result of his investigations he finds that at single examinations hot and cold spots show a punctate arrangement, that on repeated examination the number of spots is greatly increased but that many of those formerly found no longer respond, that when a mild erythema is produced the sensation of heat can be obtained from practically all points of the affected surface. The punctate distribution of sensitive spots found at a single examination is explained by the view that in the skin there is a constant coming and going of activity in the different parts. To this he applies the term "fluctuation."—The "Law of Fluctuation" or of Alternating Periods of Activity and Rest in Living Tissues, by P. T. Herring. The assumption of this law appears to be a necessity in the case of all tissues that are subject to the law of "all or nothing." Graduation of activity in an organ made up of units subject to the law of "all or nothing," is due to a varying number of units being brought into action. The "law of fluctuation" demands an alteration of the units engaged. Examples are given of fluctuation in nerve, muscle, and glands.—Hysterical Pain, by R. G. Gordon and H. H. Carleton. In a closely reasoned paper the authors seek to show that hysterical pain is due to disintegration on the cortical level, and that the object of treatment must be to restore integration.

ANNALS OF MEDICAL HISTORY. Vol. V., No. 3. (New York: Paul B. Hoeber. $2.50.)—The first paper in this interesting number deals with a subject known to few—namely, anatomical fugitive sheets. These were single sheets of an engraved anatomical subject, sometimes with superimposed flaps, showing different layers of tissue, and Dr. Leroy Crummer has collected a vast amount of information thereon, having been fortunate enough to obtain some of these rare publications for himself.—Dr. Walter Mendelson writes upon Maimonides, his paper being inspired by the discovery by Dr. Solomon Schecter in a synagogue at Cairo of autograph letters of Maimonides and his son. Maimonides practised for a time in Cairo and Dr. Crummer gives a translation of a letter from him to a friend describing his strenuous daily routine.—Dr. M. Charlton continues his account of Medicine in Lower Canada under the French regime 1608–1759 and for some years later. This instalment contains an account of the St. Paul's Bay disease which seems to have been a virulent form of syphilis, and of another epidemic called the Molbay disease, apparently something of the same kind.—Other papers are one on the Life and Work of William Hewson, by Dr. G. H. Bailey; on the Earlier Methods in the Treatment of Syphilis, by the Editor, Dr. F. R. Packard; on Primitive Medicine in the Philippines, by Dr. A. Villegas; and on Hydrophobia Four Centuries Ago, by Dr. W. R. Riddell.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

IV.—TRANSFER OF PRACTICES: POINTS FOR THE PURCHASER.

BY COLIN M. OLIVER
AND
OSWALD A. HEMPSON.

Is there no physician there?—Jeremiah viii. 22.

IT can safely be stated that with comparatively few exceptions, every medical man has at some time in his professional career to consider the purchase of a medical practice, or a share in a medical practice. This is a matter of the utmost importance, and an initial mistake may have disastrous results to an unwary purchaser. The whole of the average medical man's professional education, from the time when he first commences his studies, is devoted to professional subjects. He receives no training or information in what may be called the business side of his profession, and as a consequence it is usually found that when he wishes to commence practice, he has very little idea how to set about acquiring a practice, what price he should pay, and generally what steps he should take to ensure that he is adequately protected from the pitfalls which await him, and which could be guarded against by the exercise of proper care and foresight.

In these notes it is proposed to deal with a few of the points which experience suggests may be of some assistance to members of the profession in approaching so vital a matter.

Types and Particulars of Practice.

The first point for decision is the type of practice to be acquired. Whether it is situated in the country or in a large town, and whether the patients are mainly drawn from the well-to-do or the poorer classes of the population, and whether there is to be particular scope for surgery or any particular branch of medicine, all raise different points for consideration.

Having decided upon the type of practice, the medical man's next step is to obtain particulars of such practices as are for sale of the type required. This is done by watching the advertisement columns of the medical press, or by application to medical transfer agents for particulars of any practices they may have upon their books. The particulars to be supplied from either source to enable the prospective purchaser in the first instance to satisfy himself that the practice offered for sale warrants further inquiry are shortly as follows: The annual gross receipts from the practice for the immediately preceding three years, the average number of confinements and fees receivable therefor, the scale of fees charged to private patients, information showing how long the practice has been established, number of panel patients, what appointments are held, and whether these are transferable. Full particulars should be obtained as to the residence available for the purchaser, and as to any separate surgery used in connexion with the practice, and it should also be stated whether the vendor has been in the habit of doing his own dispensing. Finally the price asked must be stated.

With this information before him the prospective purchaser will be in a position to judge whether or not the practice is likely to satisfy his requirements. If he considers that it will, he should arrange an appointment to interview the vendor. At this interview he will, of course, in the first place have regard to the neighbourhood, and make general inquiries as to the number of medical men already practising in opposition in the district, the probability or otherwise of extending the practice, the expense of running it, and whether it affords adequate opportunities for

the practice of any branch of medicine or surgery to which the applicant has any special leaning.

The residence and surgery accommodation offered should also receive special thought. The importance of this matter frequently receives insufficient consideration. The house comprises a very material item in the goodwill of a practice, and it is therefore of great importance that, if possible, the residence and surgery should be purchased, or failing this that a sufficiently long lease should be secured, to afford adequate protection to the purchaser. There have been cases where a purchaser has acquired a practice without sufficient security of tenure of the house, with the result that very shortly after the completion of the purchase he has received notice to quit. At the best in these cases he is put to the expense of finding other accommodation which may be quite unsuitable; at the worst he may be quite unable to find any accommodation, in which event he can say good-bye to the practice. Or a rival practitioner may acquire the house, and in so doing he will undoubtedly also take over some of the patients with the house.

Purchase Price.

If these preliminary inquiries prove to be satisfactory, the next, and all-important question of the purchase price has to be examined. The purchase price of a medical practice is invariably based upon a number of years' purchase of the average gross receipts. It is usual to work out the average gross receipts for this purpose from the three years immediately preceding the date of purchase. It is difficult to lay down any hard-and-fast rule as to the number of years' purchase which should be paid, as this must of necessity vary with the individual circumstances. A fair price to pay for a practice with an adequate introduction is one and one half years' purchase, but when purchasing a practice on the death of the incumbent, one year's purchase is as a rule the maximum amount which should be paid for an immediate succession. The value of a practice on a death vacancy, however, rapidly declines, and if more than a month has elapsed since the death of the prior incumbent, the price should be less than one year's purchase.

Partnership.

If the practice offered is a share in a partnership, two years' purchase is the usual price, but this again varies according to the class and character of the practice.

It is sometimes arranged that the purchaser of a share in a practice shall for a preliminary period of from three to 12 months be employed as an assistant in order that he may obtain a thorough knowledge of the practice. In this event the purchaser enters into an agreement with the vendor to serve him as assistant for the period arranged, and the agreement contains an option on the part of the purchaser to purchase a share in the practice on agreed terms, on giving notice before a specified date. It is felt by some that this is not a good method of being introduced, as the patients may for some time afterwards regard the purchaser as only an assistant, and there is a natural preference by patients to be attended by a principal.

Another and perhaps more frequent method is for the purchaser to enter into preliminary articles of partnership with the vendor for a period of from one to five years, and in this event the articles of partnership contain all the usual provisions, and, in addition, a right for the purchaser to buy the whole of the vendor's interest in the practice within an agreed period, or upon the prior death of the vendor. This is a useful method where an elderly practitioner is desirous of gradually retiring from his practice, and from the point of view of the purchaser has the advantage of giving him a prolonged and gradual introduction to the patients, but, not unnaturally, the purchase price under such circumstances would be higher than it would be in the case of an ordinary out-and-out purchase.

It is not proposed to deal at length in these notes with points which may arise on entering into an ordinary partnership, but it is well to mention one point of great importance, which is sometimes not regarded with sufficient care by a prospective partner, and that is the question of compatibility.

With the exception of marriage, there is no relationship which binds human beings together so closely as a partnership. It therefore behoves a would-be partner to study the character of the person or persons with whom he proposes to enter into such close contractual relationship, having regard to the fact that the success or otherwise of the practice will depend on how well the partners work together for the mutual good of the partnership. If there is any friction or disagreement between partners, or if there is any lack of confidence or goodwill between them, a position arises which makes it impossible for the practice to be worked to the best advantage, and may ultimately end in litigation or arbitration proceedings involving heavy expense.

Investigation by an Accountant.

Sometimes it is agreed that the purchase price shall include the vendor's stock of drugs, drug bottles, surgery fittings and effects, and sometimes these are taken over at a valuation. This point should be made clear in arriving at the purchase price. The purchaser should agree the purchase price with the vendor, subject to proper investigation of the vendor's books and practice records, in order that the vendor's representations as to the receipts of the practice may be verified. This investigation should be undertaken by an accountant, who should preferably be one who is used to the peculiarities of medical practices. A vendor who declines to afford facilities for investigation of his books should be regarded with suspicion. A purchaser who neglects to make the usual and reasonable investigation will find difficulty in obtaining relief from the courts if he discovers after completion of the purchase that the practice is not so good as he expected, when a little vigilance on his part would have been sufficient to disclose the true state of affairs. There is a maxim of law which every purchaser should keep well before him, and that maxim is "Caveat emptor."

It is inadvisable to have anything to do with a vendor who claims that he keeps no books, or that they do not show the full receipts "because of income-tax." In such cases, if the purchase is proceeded with, the purchase price should only be based upon such figures as can be proved.

Appointments and Panel Practice.

Difficulties may arise with regard to appointments held by a vendor. If the income from such appointments is included in the average gross receipts of the practice for the purpose of arriving at the purchase money, the purchaser should insist that, in the event of any such appointment not being obtained by him within a period of, say, six months from the date of the purchase, so much of the purchase money as is attributable to the remuneration from any appointment not obtained by the purchaser shall be refunded to him. The vendor in such cases will in turn insist that the purchaser should do his utmost to obtain all the appointments.

At the present time, when the future amount of the capitation fee payable under the National Health Acts is uncertain, a purchaser should require that in the event of the capitation fee being reduced within one year of the date of purchase, the purchase money should be calculated upon such reduced fee, and the difference should be refunded to him. Care should be taken by the purchaser in agreeing the purchase price that an allowance is made in respect of any reduction in the per capita fee under the National Insurance Acts, where the period covered by the average gross receipts of the practice for the purpose of arriving at the price includes such fees at a higher rate than that current at the time of purchase.

Adequate Introduction.

A purchaser should insist upon the vendor giving him an adequate introduction to the patients of the practice. What is an adequate introduction varies according to the different types of practice. It will, for instance, be longer in a scattered country district than in a closely populated industrial district. The introduction to a high-class practice has to be carried out very gradually and with the greatest tact. The purchaser should bear in mind in discussing this point that the introduction is really the only tangible part of the goodwill which he is purchasing. A clause should be inserted in the assignment of the practice to the effect that in the event of the agreed period of introduction being curtailed by the death or permanent incapacity of the vendor, there shall be a reduction of the amount of the purchase money, proportionate to the time by which the period of introduction is curtailed. In purchasing a practice on the death of an incumbent much may be done by way of introduction by the relatives of the deceased, and this should be stipulated for.

Great care should be exercised that any circular letter which is sent out is so worded as to give no offence to other practitioners in the neighbourhood. Such circular should not contain anything which savours of an advertisement or puff, and must only be sent to persons whose names appear upon the books of the practice as having been patients within the last three years immediately preceding the transfer of the practice.

If an adequate introduction is not agreed to by the vendor some reduction should be made in the purchase price by way of compensation. During the period of introduction it is usual for the expenses and profits of the practice to be shared equally between the vendor and the purchaser. An alternative is for the purchaser to bear all the expenses and receive all the profits, and to pay the vendor a fee at the rate usually paid to a locum tenens in the district. The purchase money should be paid as to part on the commencement, and as to the balance on the conclusion of the period of introduction.

Restraining Clauses.

In order to safeguard the practice to the purchaser he must insist upon the vendor entering into an adequate covenant restraining him from practising in any capacity within a given radius from the centre of the practice—usually taken from the practice house. The extent of the radius varies according to circumstances, but it should not be made wider than is reasonably necessary for the protection of the purchaser. It is useful to agree that any question, dispute, or difference shall be settled by arbitration. This method of settling disputes avoids the possibly harmful publicity which an action would entail.

It is usual for the stamp duty upon the assignment of a medical practice to be shared equally by the vendor and purchaser. In the absence of an express stipulation to this effect, however, it would fall upon the purchaser. He should, therefore, arrange with his vendor that this expense should be shared. Care should be taken that the assignment is properly stamped. If it is not so stamped, any party to it will have to pay the stamp duty and a penalty before the document can be used in any court of justice.

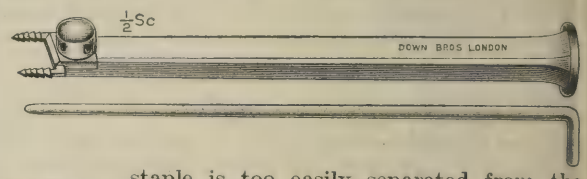
A Warning.

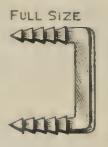
In conclusion, a few words of warning may usefully be added. A purchaser should not sign any definite offer to purchase until he has received his accountant's report. If he signs an offer it should be made subject to investigation and satisfactory report by accountants, and subject to approval of the necessary documents by his solicitors. A purchaser should not commence work in the practice until all his investigations are satisfactorily completed, and the necessary assignment of the practice is signed and completed. A purchaser should insist on the employment of a solicitor to approve the documents in connexion with the purchase on his behalf. It is astonishing how often medical men—who in their own profession would have nothing to do with unqualified persons—are content to allow agents and persons without any legal training to prepare legal documents for them. Experience has shown how essential it is that such documents should be prepared by persons properly qualified to do so. Questions involving difficulty and expense frequently arise upon the construction of badly drawn or incomplete documents. It then becomes necessary to seek legal advice, and to incur expense which might have been avoided if a solicitor had been consulted in the first instance.

New Inventions.

A NEW INSTRUMENT FOR USE IN THE RADICAL CURE OF FEMORAL HERNIA.

EXPERIENCE of a modified method of the Roux operation for the cure of femoral hernia in children by using the Jacöel bone staple has made me enthusiastic in its recommendation. The original staple-holder, however, when employed for the operation in adults, is found to be insecure, and the





staple is too easily separated from the holder. I have therefore devised the staple-holder shown in the illustration, the use of which renders the operation more satisfactory. The holder and the staples are made in two sizes—one set for children, the other for adults. The operation proceeds according to Roux, but the sac is utilised as in Macewen's radical cure for inguinal hernia. The ramus of the pubis should be well freed from the pectineus muscle. The femoral vessels should be well retracted outwards to ensure their immunity while the staple is being placed and driven into the bone. X ray examination afterwards will give the appearance of the hip-joint being penetrated by the staple, but there is no danger of this whatsoever. The staple-holder consists of a punch and a screw which, when tightened by a rod, presses on the free plate underneath and firmly grasps the horizontal bar of the staple, while the staple-points are accurately placed so as to enclose part of Poupart's ligament and hammered into the ramus of the pubis. A slight relaxation of the capstan screw by the rod releases the punch. The fluting of the staple prevents it again working loose, thus rendering the one criticism of the Roux operation inapplicable.

Messrs. Down Brothers, Limited, St. Thomas's-street, London, S.E. 1, are the manufacturers.

ALEX. MACLENNAN, M.B., C.M. Glasg.

ROYAL SOCIETY OF ARTS.—Among the many interesting lectures to be delivered this session are two remaining Cantor lectures on Jan. 28th, and Feb. 4th, at 8 P.M., by Dr. Eric Keightley Rideal on Colloid Chemistry. On Feb. 27th, at 8 P.M., Dr. C. S. Myers, F.R.S., will speak on the Use of Psychological Tests in the Selection of a Vocation. On March 12th, at 8 P.M., Mr. Alan A. Campbell Swinton, F.R.S., will give Personal Recollections of some Notable Scientific Men.

UNIVERSITY OF VIENNA.—The *Jewish Chronicle* states that an offer from Mr. Bosel, a Jewish financier, to meet all financial obligations incurred by the State on behalf of Vienna University has been accepted by the Austrian premier. The University budget should thus be restored to the pre-war standard and the University enabled to extend its operations without fear of financial difficulties. An official statement announces that there is no further danger of anti-Semitic disturbances at the University.

THE LANCET.

LONDON: SATURDAY, JANUARY 26, 1924.

SPIRITUAL HEALING: THE CURE AND THE CURÉ.

As an outcome of the Lambeth Conference of 920 the Archbishop of Canterbury appointed a committee to consider and report upon "the use with prayer of the laying on of hands, of the unction of the sick and other spiritual means of healing." Under the chairmanship of the Bishop of Oxford the committee consisted of seven bishops and eight distinguished priests, with Sir CLIFFORD ALLBUTT, Sir ROBERT ARMSTRONG-JONES, the late Prof. W. H. RIVERS, Dr. WILLIAM BROWN, Dr. J. A. HADFIELD, and Dr. JANE WALKER. Their report has now been issued,[1] and is so commendably brief and straightforward that none of the many busy people whom it concerns have any excuse for neglecting it; more than half of the pamphlet is occupied with a learned discussion of the historical aspects of the question by Canon A. J. MASON and Dean ARMITAGE ROBINSON, and with some suggested forms of service.

The committee accepts without reserve the plain fact of experience that the mental attitude of a patient has a great deal to do with the effect and progress, sometimes also with the initiation, of the pathological conditions. The influence of mind on the body, known since the earliest times, was to some extent forgotten and overlooked in the materialistic rise of modern medicine during the nineteenth century. It is little to be wondered at that the flood of new and tangible knowledge which the morbid anatomists let loose led to a misconception of the position which has persisted till quite recent years, and indeed is still pretty widely prevalent. In orthodox medicine disease came to consist of alterations in anatomy or in perversions of physiology, and it became immoral to treat the symptoms which plainly constitute the disease as far as the patient is concerned. But patients are persistent, and there followed a period when medical men had to recognise that there were a good many people who resented the medical attitude of non possumus; though they presented no particular morbid anatomy they had symptoms which did not readily clear up under the rather unsympathetic treatment which they generally received. That time has, however, now passed, and everyone allows that any attempt to distinguish sharply between "organic" and "functional" disease is impossible. The "functional" element is present with every queasy stomach as well as with hysterical palsies, and we have got back again to the rational recognition that among the most important factors in the treatment of disease are the personalities of patient and physician. Thus pastoral medicine becomes of real importance. Extreme views have been held on both sides; it is well to recognise that it is as useless to deny the value to treatment in a case of typhoid fever of that sympathetic environment that promotes faith and confidence, as it would be idle to supply nothing but mental comfort to the victim of a broken leg. (The Minister of Health (see p. 209) hesitates to print a certificate of death alongside the other certificates on the insured person's pink paper, recognising the influence of a sinister suggestion.) The Archbishop's committee sets out clearly the three main lines of healing. With material methods they are least concerned; they point out, however, that their efficacy depends to some extent on the faith and suggestion which are always at work. In psychical methods—re-education, suggestion, psycho-analysis—they recognise a common ground between those who have the cure of bodies and those who have the cure of souls. They commend a fuller knowledge of modern psychology to the clergy, but emphasise their view that nothing like direct treatment should be undertaken except in close coöperation with a good physician. It is in the third department, devotional and sacramental healing, that the special province of the clergy lies, and the committee expresses the opinion that this can certainly achieve complete or partial bodily recovery, though admitting that it has done nothing which has not been done by psychotherapy without religion. But in this therapeusis the healing of the spirit is primary, the healing of the body secondary. Its object is the restoration of the whole man and his elevation to a higher level; this will often include his physical betterment as a by-product. It is not difficult to believe that the committee is right. The serene quiet of those who have achieved a faith in other-worldliness may lead at once to the neglect of any physical crosses which may have been put upon them and to the prevention of those ills which come from the fidgety restlessness of this life. Whether we can at present translate the cheerful serenity of belief into terms of blood pressure or digestion or adrenalin or not, no one will doubt its importance in the prevention and cure of disease.

As for practical procedure, the committee doubts the value of services of healing where considerable numbers of sick people gather together. Treatment is best undertaken individually, and in this prayer should form the first line of approach to be followed, if desirable, by unction (i.e., anointing with oil by a priest), or the laying on of hands (by a priest or a layman), or both. The recognition that particular persons have exceptional powers by the institution of licenced healers is not approved of. It should be noted that Sir CLIFFORD ALLBUTT and Sir ROBERT ARMSTRONG-JONES desire to dissociate themselves from the recommendation of the use of unction. It would be interesting to know their reasons; at the lowest valuation it might prove a useful method of suggestion.

[1] The Ministry of Healing. London: S.P.C.K. 1924. Pp. 43. 6*d*.

THE CAPITATION FEE INQUIRY.

THE Court of Inquiry appointed by the Minister of Health to determine the capitation fee to be paid to insurance practitioners as from Jan. 1st concluded its public sittings last Monday. We understand that the decision of the Court may be expected at an early date. It will be recalled that the original proposal of the Minister was that the capitation fee of 9*s*. 6*d*. should be reduced to 8*s*. 6*d*. for three years, or 8*s*. for five years. The claim of the doctors was that the fee should be from 10*s*. 4*d*. to 10*s*. 9*d*., while the approved societies asserted that a fee in the neighbourhood of 7*s*., certainly not more than 7*s*. 6*d*., was fully sufficient. The Minister admitted that it was a "most complex problem." The Conference of Local Medical and Panel Committees, adopting the recommendation of the Insurance Acts Committee of the British Medical

Association, definitely rejected the Minister's offer of 8*s*. for three years, and requested arbitration on the offer of 8*s*. 6*d*. for three years (failing arbitration this offer, too, to be definitely rejected). The doctors further declared that any agreement with regard to the capitation fee must be subject to a further agreement, which would have reference to the special circumstance of rural practitioners. In conveying their decision to the Minister, the profession expressed every wish towards a peaceful solution, and recalled that, throughout 1923, its representatives had striven for a settlement by consent, and for the cultivation of friendly relations with representatives of approved societies and others interested in insurance administration. The Minister at first refused arbitration, stating that in arriving at this decision he had "regarded his position as that of an arbitrator with the added responsibility of his ministerial duty." When, however, more than 90 per cent. of insurance practitioners placed their written resignation from insurance service in the hands of the Insurance Acts Committee, the Minister made a further proposal in alternative form. He offered either to pay 8*s*. 6*d*. for a period of five years, or to appoint an independent Court of Inquiry, whose finding should be binding on both parties for one year. The second alternative was accepted by the Insurance Acts Committee, and the Court was appointed on Dec. 12th, under the chairmanship of Mr. T. H. HUGHES, K.C. The Court was opened on Jan. 4th, and has held five public sittings. Under the suave direction of the Chairman, the proceedings have, on the whole, been marked by an atmosphere of courtesy and mutual consideration, and the occasional tendencies to introduce irrelevant recriminations have been checked. Most of the evidence showed an intelligent appreciation of the wider principles necessarily involved in the development of a medical service which affects more than one-third of the total population. Particularly significant was the unanimous expression of opinion that the medical profession, as a whole, had conscientiously fulfilled its responsibilities towards the insured population. A considerable weight of evidence supported the view that the insurance service had steadily improved since its inception, and that it offered more complete and efficient medical treatment than was provided under the earlier friendly society benefit systems. The evidence disclosed that the number of complaints which are made against individual doctors is surprisingly small, representing approximately one complaint from every 12,000 insured persons over a period of four years. Such criticisms as were offered were directed largely against the system of certification—the approved societies complaining that their funds are suffering considerable loss through lax certification; the doctors, on the other hand, contending that the existing certification rules are in many respects unnecessarily oppressive and difficult of application.

The evidence submitted to the Court represented four interests—the Ministry of Health, the medical profession, the insurance committees, and the approved societies. The societies who had determined to take no part in the proceedings reconsidered this decision at the last moment, and presented their case after the evidence of the other parties had been concluded. Happily, the fear of "undignified disputes between the doctors and the societies" which had been expressed by the Minister was not realised. Some of the witnesses in their anxiety to safeguard the funds of their societies appeared to ignore the principle that any great scheme of national health development must, in the end, rest upon a willing and satisfied medical profession. But, on the whole, the evidence of the societies while stressing, as it was bound to do, cases of alleged loose certification, acknowledged, in the main, the adequacy of the service which had been rendered to insured persons. The financial case of the societies was based on the pre-insurance contract rate of 4*s*., the contention being that the 7*s*. 3*d*. offered when medical benefit first came into operation represented an unjustified increase on the earlier club practice rate, and that all subsequent calculations—based as they had been on the initial 7*s*. 3*d*.—were excessive. The evidence of the insurance committees for England, Wales, and Scotland unanimously expressed the view that insurance practitioners, as a whole, had faithfully rendered their services to the insured population, and that, with few exceptions, the insured person receives as good a service as is given to other persons in similar positions who pay private fees. In expressing these opinions the committees claimed that, as the statutory bodies entrusted with the administration of medical benefit throughout the country, they were brought into close touch both with the doctors and the insured persons, and were in a position accurately to judge the day-to-day working of medical benefit. The case of the Ministry of Health was mainly statistical. It maintained that the reduction in Civil Service bonus since 1920, consequent on the fall in cost of living, offered a ratio of reduction which could fairly be applied to the capitation rate, and that on this basis, and having regard to the alteration in practice expenses, &c., the offer even of 8*s*. for five years represented a more liberal fee than the mathematics of the case would support. By applying a time rate equivalent, based on the assumption that each insured person requires on the average 3·5 services a year, the Ministry contend that a panel of 2000 insured persons would involve approximately eight visits and 16 surgery consultations each day of a working year of 300 days, and that this should occupy not more than one-half or at most four-sevenths of the doctor's time. The income resulting from such a practice on a capitation fee of 8*s*. 6*d*—£665 net for half-time work—is, in the Ministry's opinion, adequate.

The case for the medical profession was presented by the Insurance Acts Committee of the British Medical Association; the Medical Practitioners' Union gave separate evidence on behalf of its members. The case for the doctors lays stress on the principle that unless the remuneration paid for insurance practice is adequate, and equivalent to the rate of income derived from private practice, the best minds and most suitable personalities will either be attracted to other professions and callings, or will devote themselves to other branches of medical work; that while the profession is anxious that the service given to insured persons should be a full and complete general practitioner service, full recognition must be given to the extended conception of what such a service involves; and that a uniform capitation rate for the country must have regard to the best services and most arduous conditions of practice, and should not represent the lowest sum for which medical attendance on insured persons can be obtained. The doctors believe that the Ministry have overestimated the number of services which the practitioner can with justice to himself or his patients perform, and they dispute the correctness of the Civil Service ratio of reduction. Their statistical case is based on the very complete tables prepared by Prof. A. L. BOWLEY. The case for the doctors was presented with great skill by Dr. H. B. BRACKENBURY, and there will, we believe, be general agreement with the opinion expressed by the Chairman that the profession are fortunate in

aving so able an advocate. Dr. BRACKENBURY was bly assisted by Dr. A. COX. Whatever may be the nding of the Court the medical profession will, e think, be satisfied that, in the hands of the nsurance Acts Committee of the British Medical ssociation, their case has been presented in no narrow pirit of bargaining, but has been based on a knowledge f the full nature of the responsibilities involved in a mplete and efficient general practitioner service. he conviction is displayed that the service can be aintained at the high standard desired by the pro- ssion no less than by the Minister, only if the muneration is adequate both on economic grounds, nd as tending to encourage the progressive usefulness f the service to the nation.

AN ABRAMS INVESTIGATION.

THE January issue of the *Scientific American*, ontaining the fourth instalment of an inquiry into he Electronic Reactions of Abrams (E.R.A.), reached s at the same time as the announcement of his death. Ve gave last week a brief sketch of Dr. Abrams's areer, and in our present issue Dr. Howard Humphris ells the story of his claims and how these claims are upported. Dr. Abrams gradually developed the heory that every illness to which man is heir is due o erroneous vibrations of electrons. He next con- tructed an instrument known as an "oscilloclast" y which these vibrations could be measured and eproduced, and it was then but a short stage for him o restore the normal vibration found in health. n doing so he was able to dispense with drugs, for he ound that effective drugs possessed a like vibratory ate to the diseases for which they are effective. wo courses were open to anyone who became possessed f such momentous discoveries for the good of man- ind. In the first instance the inventor might have emonstrated step by step the scientific principles nderlying the mechanism by which, for instance, the lacing of a dried specimen of blood in a box produces n audible change of percussion note or a palpable oughness of the skin in the reacting medium. To hat extent the timbre of the percussion note is nder the conscious or subconscious control of the ercussor has been impressed upon several generations f clinical clerks, for there are well-known instances here clinicians of great repute and experience have een able constantly to find physical signs which ere never confirmed by the pathologist. Dr. Abrams never attempted to set out the cogency of he sequence of events so as to satisfy the scientific bserver. We understand, however, that he was ccupied shortly before his death with working out method of more objective control. The second ourse open to such an inventor would have been o ask the medical world, accepting for the moment is methods, to satisfy themselves that the results btained thereby do actually correspond to patho- ogical findings. The *Scientific American* found Dr. Abrams unwilling to submit to comparative lood tests on the ground that electronic and clinical iagnosis are two entirely different things. To those nable to confirm his results Abrams simply declared hat their conception of his methods was akin to that f a "Swiss cheese-sandwich replying to questions con- erning the nature and composition of celestial bodies." Ie deliberately removed his observations from a egion where they could be controlled by those brought p in the methods and ideals of medical science. heir interest is psychological and now antiquarian.

INDEX TO "THE LANCET," VOL. II., 1923.

THE Index and Title-page to Vol. II., 1923, which vas completed with the issue of Dec. 29th, is ow ready. A copy will be sent gratis to subscribers n receipt of a post-card addressed to the Manager f THE LANCET, 1, Bedford-street, Strand, W.C. 2. ubscribers wishing to receive the Indexes regularly s published should indicate this desire.

Annotations.

"Ne quid nimis."

VITAL STATISTICS FOR 1923.

THE Registrar-General has issued a provisional statement of the figures for birth-rate, death-rate, and infantile mortality during the year 1923.

—	Birth-rate.	Death-rate.	Infant mortality-rate.
England and Wales	19·7	11·6	69
105 County Boroughs and Great Towns including London ..	20·4	11·6	73
157 Smaller Towns	19·8	10·6	68
London	20·2	11·2	61

The smaller towns are those with an estimated population in 1921 of 20,000–50,000. The death-rate for England and Wales relates to the whole population, but that for London and the groups of towns to the civilian population only. The birth- and infant mortality-rates for London have been provisionally corrected for transfers.

The Registrar-General remarks that the birth-rate of England and Wales as a whole is the lowest recorded, except during the war years 1917–19, while the death-rate and infantile mortality are the lowest on record. These provisional figures, which are not likely to require substantial modification, have been got out for the information of medical officers of health.

THE MENTAL HOSPITALS SERVICE.

WE have been taken to task by a friendly critic for the tone of our comments upon the reports of mental hospitals, and especially for the brief survey of these reports on p. 44 (THE LANCET, Jan. 5th). Allusion was there made to the difficulty of obtaining mental nurses. "Anyone reading this," our correspondent objects, "would think that such difficulties were peculiar to mental hospitals. Of course it is well known that general hospitals, fever hospitals, special hosp tals of all kinds, and cottage hospitals have the utmost difficulty in getting staff, and domestic servants are becoming an unknown quantity." We also alluded to the unduly large proportion of mental nurses, both male and female, who never obtain their certificate, inferring—our correspondent complains—that mental hospitals are to blame, "whereas the serious problem of the hour everywhere is the lack of ambition and of the capacity for steady work in the younger generation." It has been very far from our intention to belittle the work done at mental hospitals. In four instances during last year we took occasion to commend reports as exceptionally full and interesting; on three occasions reference was made to valuable research in progress, and in a dozen at least there were records of therapeutic innovations, amplified staff, and improved equipment. We recorded as noteworthy the practice of one large hospital in allowing large numbers of patients out on trial and on parole, in spite of the added anxiety and trouble involved. Dentists, surgeons, and ophthalmic surgeons had been appointed, in one case an instructor in occupational therapy; X ray plant, pathological laboratories, baths, new wards, convalescent homes, and out-patient departments had been instituted. Wherever such changes as these were put on record we noted and welcomed them.

We fully appreciate the difficulties with which medical superintendents of mental hospitals have to contend, and any adverse comment on the administration of these hospitals which has been made in our columns has been directed towards the removal of some of these difficulties as an essential condition of improved treatment for the insane. It is not within the power of the medical staff to alter them; that power is in the hands of lay committees, and ultimately in those of the ratepayers. Defects in the

service are capable of remedy only by increased expenditure, whether on buildings, salaries, equipment, on the means of recreation, or on food and clothing. Until money is made available for these purposes it is our duty to indicate the directions in which it is needed. The only particular in which the work of medical superintendents has been criticised is not immaterial to the present point at issue. The criticism was this: "It is perhaps not out of place to comment on the very brief and formal style which characterises these reports; it is frequently difficult to gain from them any clear picture of the work which it is their purpose to record. This must always appear as a missed opportunity of enlightening the public, and a few paragraphs which do no more than retail the main statistics in another form, and record minor structural changes and formal acknowledgments, can hardly be said to do justice to the vast amount of patient and careful work performed by the staff of such institutions."

How can the successful features of the year's work at a mental hospital be appreciated when such information is absent from its reports? Further than this, a number of mental hospitals publish no reports at all, and the last available report of the important and numerous institutions under the control of the London County Council was issued in 1922 and dealt with the year 1920. The public and the medical profession are surely entitled to be adequately informed as to the work of these hospitals, whose upkeep is a large item of public expenditure, and whose administration affects the welfare of many thousands of patients.

BLOOD TRANSFUSION IN JAPAN.

A JAPANESE investigator, Dr. Takeo Torii, has recently published in German an account of experiments upon the problems connected with blood transfusion conducted by him during three years at the University of Fukuoka.[1] His investigations divide themselves into two series: (1) experiments on animals with transfusion of incompatible blood, and (2) clinical observations on transfusion of compatible blood in human beings. The results in general do not furnish much information that is new, but they, at any rate, confirm the observations of others. Attention may be drawn, however, to a few points of interest. It has often been noticed that there is an immediate increase, in the recipient's blood, of the red cells and hæmoglobin content, but that a fall occurs soon afterwards. Dr. Torii has found that this is to be accounted for by a temporary "hydræmia" or dilution of the blood which takes place within 3 to 15 hours of the transfusion, both of compatible and of incompatible blood. This observation is of some importance in the interpretations of the rather anomalous results that are sometimes obtained in attempting to estimate the effect of blood transfusion by determining the red cell content. Dr. Torii has also shown that transfusion of incompatible blood produces in the recipient an invariable leucocytosis, in which all the varieties of cell participate. Abnormal white cells also appear and phagocytosis of the foreign red cells can be observed. If the production of abnormal cells be taken as an indication of the degree of poisoning produced, then Dr. Torii has been able to infer that the intravenous injection of foreign red cells is much more powerful in its effect than is the injection of foreign plasma. Some observations on the effects of injecting defibrinated blood are also interesting. The re-infusion of blood from the peritoneal cavity in cases of intra-abdominal hæmorrhage has been often practised in recent years, but some fatalities have been recorded. Dr. Torii has found that the immediate transfusion of the recipient's own defibrinated blood is highly injurious; but that after the lapse of a few hours, or after warming the blood, this effect is not produced. Dr. Torii's clinical observations are perhaps less interesting than those made in the laboratory. He has found the use of citrated blood to be the simplest and safest method. As regards donors, he emphasises the necessity for a very careful choice when repeated transfusions are being given, owing to the fact that any incompatibility that may be between two individuals is heightened by transfusion. Attention is thus again drawn to the fallacy of supposing that the blood of group IV. donors (the "universal donor") can be given indiscriminately. Dr. Torii claims, indeed, to have found that red cells of group IV. are often agglutinated by the serum of group II. blood, though the reaction is much slower and less pronounced than between the groups usually regarded as incompatible. This observation, if correct, is sufficient by itself to dispose of the "universal donor" theory and to explain the slight reactions that are sometimes found to follow the transfusion of theoretically compatible blood. Dr. Torii's list of 231 references is valuable, as it contains many German contributions not recorded by other authors.

[1] Mitteilungen aus der medizinischen Fakultät der kaiserlichen Kyushu-Universität, Fukuoka, Japan, 1923, Band vii., pp. 137–294.

THE MECHANICAL TREATMENT OF ACUTE ANTERIOR POLIOMYELITIS.

AT a meeting of the Manchester Medical Society held on Jan. 9th Mr. Harry Platt opened a discussion on the mechanical treatment of acute anterior poliomyelitis. He pointed out that it had long been recognised that the serious disablement resulting from this disease was in many cases dependent on the existence of deformity rather than on the paralysis. Although it was possible at a late stage to correct multiple contractures by surgical measures and to make comparatively helpless children walk in suitable appliances, the surgical problems afforded by these patients would be much simpler if a deformity had been prevented from the first. In spite of genuine advances in the treatment and handling of poliomyelitis in its earliest stages, a mass of neglected cases were still encountered. In geographical areas served by a special hospital, such as exists now in Shropshire, Oxfordshire, and the Lake country, epidemics of acute poliomyelitis could be adequately provided for and the early mechanical treatment of each individual case could be instituted. In the cities, however, the conditions were not so favourable. Delay in applying efficient early treatment is often due to the difficulties of establishing a diagnosis. The clinical syndrome of the early stage of acute poliomyelitis does not appear to be familiar enough to the practitioner of medicine; in enumerating the early symptoms Mr. Platt laid emphasis on the pain and tenderness which are constant features of the initial stage. The treatment to be adopted in the acute stage must be founded on a clear appreciation of the pathological picture of the disease and of the symptoms which such morbid changes evoke. In this condition there is opportunity of applying at the earliest moment classical surgical principles: (1) Rest, for the acute inflammatory lesion. This implies the protection of the inflamed nerve cell from every form of stimulus. (2) Prevention of deformity. (3) The continuous relaxation of completely paralysed muscles. According to Mr. Platt these aims are best achieved by the immediate immobilisation of the child in the recumbent position in an apparatus which maintains fixation of the spine and limbs. There are two methods of effecting this: either the use of a plaster-of-Paris bed, or a well padded frame of the double Thomas or Bradford type. As in the early stages the paralysis is often diffuse, standardised positions may be adopted in which, with certain exceptions, no particular group of muscles are unduly favoured. The hips and knees are kept extended, and the feet placed at right angles. The position of the upper limbs should be right-angle abduction at the shoulder with the forearm flexed at the elbow and supinated, and where necessary, the wrist in dorsiflexion. Once the patient is comfortably installed in his shell he should be subjected to the minimum amount of disturbance

nd this period of complete immobilisation should utlast the stage of pain and tenderness. With the nset of muscle recovery the degree of fixation of the ody should be lessened, and the patient gradually rought into the sitting position; the affected mbs should be maintained on splints or in the emains of the plaster shell for a much longer period ntil walking is attempted. Further, the splints ould be worn as night splints for at least another wo years. When these precautions are taken the ask of re-education which follows the stage of immo- ility becomes much easier.

YEAST AND CONSTIPATION.

YEAST is an old remedy for constipation, and ome recent investigators have thrown doubt on its fficacy. However, in the current number of the *Journal of Pathology and Bacteriology* (vol. xxvii., . 42) Dr. Louis Gross, of Montreal, working in ondon with a Beit fellowship, describes experiments n rats of a very striking character. Animals were ed with normal diets and diets deficient in A and B itamins, and the activity of the alimentary canal as determined by giving a dose of charcoal and iming its first appearance in and its final disappear- nce from the stools. In one rat on a normal diet he charcoal appeared in nine hours and had entirely lisappeared in 65 hours; the same animal on the ame diet without marmite (an extract of yeast) howed the first appearance of charcoal in 12 hours, nd it was still present after 16 days. Afterwards he same animal on the full normal diet with marmite ot rid of the last of the charcoal in five days. Similarly a rat on normal diet passed 13 or 14 scybala a day, which fell to two or three a day after a fortnight without marmite; administration of small quantities f marmite soon restored the normal number. Dr. Gross points out that the delay in the passage of the charcoal cannot be explained by a lower consumption of food owing to the loss of appetite characteristic of deficiency in vitamin B, since the intake during the normal period was limited to the amount eaten during the period of B deficiency. The action of marmite does not seem to be direct and local, since n experiments on rats' intestine in vitro it had, if anything, an inhibitory effect on motion. Similar experiments on animals fed on diets deficient in vitamin A showed a marked acceleration of the passage of food through the alimentary canal. The author could detect no definite anatomical or histological changes which could be correlated with these results, failing to confirm both Colonel R. McCarrison's description of changes in Auerbach's plexus in B deficiency and Dr. W. Cramer's description of mucosal atrophy of the intestine in A deficiency. But he has adduced a good deal of evidence connecting intestinal stasis with absence of vitamin B in the diet.

MEDICAL HYDROLOGY IN ENGLAND.

IN our correspondence columns will be found an influential letter containing definite proposals for the promotion and teaching of medical hydrology in this country. These have been laid before the Ministry of Health, for the committee in charge regard as essential the recognition of hydrology and of the spas by the Government. University teaching alone cannot give the necessary stimulus and scientific coördination. The current issue of the *Archives of Medical Hydrology* recalls the large scale on which physical remedies were used for disabled men; this fine service of British spas has perhaps hardly been sufficiently recognised. A course of lectures on medical hydrology was given last year at London University, and a preliminary circular has just been issued of the next course to be held in the week commencing May 5th, with a study tour to Bath and Cheltenham. Lectures are also contemplated at provincial universities. Efforts to secure teaching of this subject in England date back many years. Some members of the present committee coöperated in 1897 with the late Dr. Theodore Williams and Dr. Alfred Havilland in circulating to the medical schools a programme of instruction in hydrology and climatology. A committee, including leading spa physicians and many other well-known names, laid a memorial in 1914 before the Senate of the University of London, detailing the elaborate teaching in foreign universities and asking for central teaching in London and a chair of hydrology and climatology. The war intervened to prevent this scheme maturing. The present committee is the fourth that has handled the matter, and we hope that its present proposals will meet with acceptance.

CANCER DEATH-RATE IN IRELAND.

THE quarterly return [1] of the Registrar-General of the Free State for the third quarter of 1923 shows a commendable regard for continuity of records, now that Irish vital statistics need to be studied in two separate official reports, for appended to a statement of deaths and causes of death in each of the 56 urban districts in Leinster, Munster, and Connaught, and the 10 urban districts in Ulster which are within the Free State, corresponding figures for the cities of Belfast and Londonderry are given by courtesy of the Registrar-General for Northern Ireland. Perhaps at the moment the most interesting death-rate is that from cancer which was only 71 per 100,000. This is a crude death-rate not corrected for age- and sex-distribution of population. The average age of the population of Ireland is greater than that of England, and other things being equal its cancer death-rate should be higher than that of England, whereas the official figures show a much lower cancer death-rate. This is no new phenomenon, the standardised death-rate from cancer in Ireland many years ago having similarly been increased by correction for age- and sex-distribution of population. Even when this correction is made cancer appears to be less fatal in Ireland than in England: and further investigation into the local incidence of cancer in Ireland, and concurrent inquiry which might elucidate inter alia whether to a considerable extent differences in official death-rates are ascribable to variations in accuracy of medical diagnosis and of medical certification, would be likely to elicit valuable information in other respects. As bearing on completeness of certification, it may be noted that medical certification is commonly more exact for deaths in institutions. Such deaths from all causes numbered 28·4 per cent. of the total deaths in Ireland in the second quarter of 1923, while in Dublin they numbered 45·1 per cent. of the total number.

COLLOID PHENOMENA IN BACTERIOLOGY.

To the fifth report on colloid chemistry of the Department of Scientific and Industrial Research,[2] Dr. E. K. Rideal contributes a suggestive article upon certain phases of bacterial activity. He begins by discussing the phenomenon that bacterial growth in fluid media is self-limiting; when, however, any culture has ceased to progress and the bacteria are separated by centrifuging, these are still capable of growing in a new medium, whilst, on the other hand, the old medium is still capable of providing pabulum for a fresh inoculation of the same bacteria. It is suggested that this is due to the inhibition of the original bacteria by surface adsorption of products of growth such as alcohols, soaps, or fatty acids. Bacteria in a fluid may be regarded as forming a colloidal system and with the large surface development of such a suspension, adsorption at the interface between the two phases becomes an important factor in the distribution of substances in solution. Any substance lowering the interfacial tension—in accordance with

[1] No. 239. Edson and Son, Ltd., 40–41, Lower Sackville-street, Dublin. Price 6*d*.

[2] British Association for the Advancement of Science. Fifth report on Colloid Chemistry and its general and industrial applications. London: H.M. Stationery Office. Price 2s. 6d.

a well-known physical law—will be distributed in greater concentration at the interface in question, in this case the bacterial envelope, than in the suspending fluid. Dr. Rideal suggests that the self-limitation of bacterial growth depends upon the production by bacteria of metabolic products, which have this effect upon the surface tension and thus become concentrated upon the bacterial surface; these substances, being in their way excretory products, are unfavourable to the organism's growth and nutrition, which finally ceases to progress. Upon removal to fresh medium, the equilibrium is upset and the adsorbed substances are to some extent desorbed, allowing growth to occur again. Fresh bacteria can grow in the old medium for a short time because the concentration of these substances in its bulk is not sufficiently high to be inhibitory. It is not possible to put this hypothesis to experimental proof by measurement of the interfacial tension between bacteria and medium, but it is easy to measure the medium air interfacial tension which in many cases will probably have a value relatively similar. It is found that with a range of antiseptics, from thymol to phenol, the effect upon the surface tension is accurately correlated with antiseptic activity, which suggests the presence of an adsorption factor on these lines. The question of the selective adsorption of the various products presented to bacteria is, in its ultimate analysis, a chemical one, depending upon the presence in the bacteria of reactive groups capable of combining with those available in the dissolved substances of the circumambient fluid.

CONJUNCTIVAL INFECTION WITH TUBERCLE.

IN 1913 A. Calmette and his fellow workers drew attention to the possibility of infecting guinea-pigs with tubercle bacilli by the conjunctival route, and it was thought that a clue had been found to the genesis of the cervical adenitis of childhood. Though the virus transmitted through the conjunctivæ spread to the cervical glands, the tracheo-bronchial glands, the lungs, and abdominal viscera, lesions at the level of the eye itself were never observed. We alluded briefly last week to similar investigations conducted by Prof. S. Lyle Cummins with results that did not in every respect tally with Calmette's. Prof. Cummins found [1] that a definite local inflammatory reaction in the eye itself usually occurs but is very late in appearing. Of two guinea-pigs infected by the conjunctival route, one (No. 125) was a normal animal, and the other (No. 123) had been inoculated a month earlier with tubercle bacilli of low virulence. In this animal acute conjunctivitis developed a day after the conjunctival instillation, whereas in the case of No. 125, the conjunctivæ did not become inflamed until the third week after the instillation. It would seem that the rapid onset of acute conjunctivitis in the animal already infected with tubercle bacilli of low virulence was due to an allergic state induced by the earlier infection. Comparisons made between the effects of subcutaneous injection and conjunctival instillation of tubercle bacilli brought out one very interesting point. Among the guinea-pigs given subcutaneous injections of varying quantities of tubercle bacilli, there was no appreciable difference in the reaction, whether 2000 million or only 2000 bacilli were injected. But when the bacilli were introduced by the conjunctival route, the course of the disease varied according to the dose; it was rapid and acute when a concentrated emulsion of tubercle bacilli was instilled, and chronic when dilute instillations were given. These observations give support to the hypothesis that in the tuberculosis of man the massiveness of infection plays an important part. The condition of the child whose only apparent defect consists of enlarged cervical glands may be compared with that of guinea-pig No. 125 which seemed to be in excellent general health six months after conjunctival infection. When killed it was found to have lesions strictly limited to the infected eye and the cervical glands, which were fibrotic and contained limited areas of caseous degeneration. Prof. Cummins suggests that artificial per-conjunctival infection should help to elucidate many of the phenomena of tuberculous infection and resistance, although the constant association of eye lesions with the cervical adenitis in guinea-pigs indicates that the tuberculous processes in the guinea-pig and man are not strictly similar. And his suggestion is worth following up.

[1] Tubercle, January, 1924.

THE TREATMENT OF NEURO-SYPHILIS.

THE issue in the discussion before the Medical Society for the Study of Venereal Diseases, reported in THE LANCET of last week, on the diagnosis and treatment of neuro-syphilis, turned largely on the value of tests applied to the cerebro-spinal fluid as a guide to prognosis and treatment. Dr. Gordon Holmes, who opened the discussion, contended that the diminution of the cell content often quoted as a sign of improvement might be due to repeated lumbar puncture, since some of the cells in the lower part of the cord are drawn off at each puncture, and the proportion found in the later counts thus reduced. Dr. Holmes confessed to have made more than one serious mistake through being guided by changes in the cerebro-spinal fluid. As to treatment he maintained firmly that the study of this fluid formed no reliable guide to the efficiency of treatment or prognosis in neuro-syphilis, except in interstitial syphilis. Colonel L. W. Harrison, as President of the Society, took up this point in a reasoned comment on Dr. Holmes's opening address. He expressed himself as anxious to accept what he understood to be Dr. Holmes's view that lumbar puncture was not so necessary for the control of treatment of cases of syphilis as our American colleagues would have us believe. Many held that no case of syphilis could be considered to be properly managed unless the treatment were controlled by examinations of the cerebro-spinal fluid, and this view entailed the difficulty that, with all precautions, lumbar puncture was apt to be followed by severe headache, which raised great practical difficulties for the ordinary patient. Perhaps the point raised by Dr. Holmes as to the effect of intensive treatment on the development of the neuro-recidive might be cleared up by the experience in treatment centres as to the number of cases of neuro-recidive which they have seen amongst soldiers treated for syphilis during the war. There were approximately 100,000 cases of syphilis treated in military V.D. hospitals in that period, most of them by a short, rather intensive course. Through the medium of this Society, statistics on this point might be collected during the next few years from medical officers of treatment centres, neurologists, and practitioners who had come across cases of neuro-recidive amongst soldiers treated for syphilis in the war years. Particulars of the actual treatment administered would be necessary, as well as of the nature of the present disease.

POST-OPERATIVE DENTAL TREATMENT OF CLEFT PALATE.

A RECENT paper [1] by Mr. A. T. Pitts on the Orthodontic Treatment of Cleft Palate Subsequent to Operation contains much information that will be found useful, not only by dentists but by surgeons and general practitioners. Mr. Pitts thinks that some surgeons have not realised that the coöperation of the dentist is absolutely necessary to get the best results in the treatment of cleft palate, and there is doubtless much truth in this contention. Surgeons who are accustomed to operate much for this deformity know how difficult it often is to get parents to see the necessity for dental treatment and for training in articulation, in the case of children who have

[1] British Dental Journal, Dec. 15th, 1923.

ndergone operations for cleft palate. They are too ot to imagine that as soon as the cleft has been osed by operation there is nothing left to be done. lr. Pitts divides dental deformities in cleft palate ito two groups: those which are due to the cleft alate itself and are indeed a part of the condition, ough not manifest until the teeth erupt; and eformities of the dental arch which result from the peration and do not exist in a case of cleft palate hich has not been operated on. He is fully justified i his statement that dental irregularities after opera- on, when occurring in the molar and premolar gions, are due to the operation, while irregularities i the incisor region are an original defect of the ongenital failure of growth, but are apt to be increased s the result of operation. At the Hospital for Sick hildren, Great Ormond-street, Mr. Pitts has had iany opportunities of studying the results and omparative merits of the two principal types of peration for cleft palate performed in this country—amely, the Langenbeck or Fergusson operation, and he so-called "flap" operation, usually associated ith the name of Sir Arbuthnot Lane. The two perations lead to different types of dental deformity hich can be readily recognised. Good illustrations f both are given. It is interesting to note the author's onclusion that the irregularity after the flap operation s generally more severe than that caused by the angenbeck operation, and being unilateral is less menable to dental treatment than the bilateral ontraction following the Langenbeck operation. n this opinion he will be supported, we think, by the reat majority of surgeons who have had opportunities f seeing the actual results of both operations. Ir. Pitts discusses fully and fairly the aims, objects, ossibilities, and limitations of orthodontic treatment of left palate subsequent to operation, and deals at length vith the technical means to be employed. Several triking illustrations are given of dental deformities efore and after dental treatment at the hands of imself and his colleague, Mr. William Ovey. The rticle, which is the result of much painstaking esearch and observation, will repay careful study by lentists and by surgeons who are interested in this mall but difficult branch of work.

"PUNCH" AS AN ANTHROPOLOGIST.

AT the second social evening of the session on Jan. 16th Sir Arthur Keith, F.R.S., delivered an ntertaining address on this subject to the Royal Society of Medicine at 1, Wimpole-street, in place of Dr. Arnold Chaplin, who, as had been previously announced, was unable to be present through illness. Sir Arthur Keith said that he was not going to consider *Punch* as a humorist, but would speak of him as a sober man of science—in other words, as an anthropologist. All of us, he said, became anthropologists as soon as we ceased calling every one "dada," and our scientific attainments increased at the school age to the point of recognising friends and enemies from the back or the front. Later, about 15, we could judge the ages of the people we saw, and so on. It was with anthropology of this sort that the speaker wished to deal—a living and practical science, not a dry-as-dust measuring of skulls and angles. And of all British text-books on this subject, he added, the best was the files of *Punch*. Considering the *Punch* artists as being in dead earnest, and unconcerned with the jokes attached to their drawings, Sir Arthur Keith showed on the epidiascope many examples of their work with which he illustrated his subject. The first series consisted of a set of studies of father and son by many different artists, in which the immature features of the son—small nose, slight eyebrow ridges, thin neck, &c.—were shown fully developed in the father, while the type remained unchanged. He then showed how age was indicated on a face, and mentioned that the nose told age changes as well as any other feature up to 55 years of age, but mobile parts, the eyelids, eyebrows, and lips, showed most change. In the course of facial development the nose often seemed to follow a system of growth on its own—that feature might be well-developed, while the forehead and chin remained infantile. Per contra, in a face with powerful jaws and heavy eyebrow ridges the nose might be small and weak. The lecturer then gave an interesting comparison of the primitive broad physiognomy and the modern long narrow face with open orbits. The modern shape, typical in the Englishman, did not probably exist, he said, before Roman times. *Punch* was very fond of contrasting the long face with the broad face—as many drawings exemplified. After a series of pictures illustrating various forms of English round heads, short and long, Sir Arthur Keith showed Mr. Punch himself to have a typically square Teutonic cranium. The chair was taken by Sir William Hale-White, President of the Society, who moved a hearty vote of thanks to the lecturer.

PROF. H. J. HAMBURGER.

BY the death of Hartog Jacob Hamburger on Jan. 4th Dutch science has suffered a severe loss, for Prof. Hamburger was not only a first-rate physiologist, but a chemist who opened up new vistas of knowledge. A pupil of Boche, Mulder, and Dibits, before graduating in mathematics and physical science, he became assistant to Donders, and this contact with medical biology was decisive for his further career. Within six years he obtained his second doctorate in medical science. He then was appointed lecturer in physiology and pathology at the Government Veterinary School, and in 1901 professor of physiology at Groningen University, a chair which he held until his death. It was his happiness to plan and to see erected a new physiological institute, which was admired by physiologists from all over the world on the occasion of the Ninth Physiological Congress, at which Hamburger presided. Among his publications the best known were: "Osmotischer Druck und Ionenlehre in den medizinischen Wissenschaften," and "Physikalisch-chemische Untersuchungen über Phagocyten." His discourse on Permeability in Physiology and Pathology, delivered in London[1] under a scheme of lecture exchange, summed up the results of a life-work on the borders of cellular physics. Much of this work of Hamburger and the group of assistants whom he attracted is accessible in the "Researches from the Physiological Laboratory of the Groningen University," published in 1920.

Hamburger took his full share in national and international scientific intercourse. In 1896 he became a member of the Dutch Royal Academy of Science, in 1909 he received an honorary doctor's diploma at Aberdeen, in 1922 a similar honour at the Veterinary University of Utrecht. In 1908, on the twenty-fifth anniversary of his doctorate in chemistry, a special number of the *Biochemische Zeitschrift* was devoted to his work. At the invitation of Baltimore University he inaugurated in 1922 the Dohme-Foundation. His colleagues in all parts of the world will keep in thankful remembrance "the little kind artless scholar," as he was called in Groningen.

THE new Minister of Health, Mr. John Wheatley, has had opportunity during the course of his career for acquiring close knowledge of some of the most important problems with which he will be called upon to deal. Until the age of 22 he worked as a coal-miner, and since then has had administrative experience in Glasgow and in Lanarkshire. His strong feeling on the need of maintaining adequate support for maternity and child-welfare and for measures directed against tuberculosis was made manifest in a stormy debate in the House of Commons last summer, and his interest in the housing question may be judged from the fact that he is President of the Scottish Labour Housing Association. We wish the new Minister good fortune in furthering the aims he has at heart.

[1] THE LANCET 1921, ii., 1039.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LV.—TREATMENT OF ACUTE OBSTRUCTION DUE TO GROWTHS OF THE COLON.

IF rectal cases are excluded, one of the commoner causes of acute intestinal obstruction, when it occurs in patients of middle or advanced age who have long experienced abdominal discomfort, is a neoplasm of the colon. The growth is usually a carcinoma situated in the pelvic colon, the beginning of the ascending colon, or one of the flexures; growths in the first-named site being by far the most common. The type of growth varies to some extent with its position, growths in the cæcal region forming large exuberant masses within the cavity of the bowel, whilst a narrow constricting fibrous ring is usually found in the pelvic colon. These growths differ from carcinomata found elsewhere in certain respects: (1) They grow more slowly and are confined to the limits of the bowel for a long time; (2) they are subject to degenerative changes; (3) they do not infect the lymphatic glands in the early stages; and (4) they produce metastases in distal parts only quite late in the disease. A theoretical consideration of these facts leads to the conclusion that malignant disease of the colon, as compared with carcinoma elsewhere, is a particularly favourable disease for operation, and this is amply confirmed by the results of actual practice.

Symptoms.

These patients give a few months' history of malaise, anorexia, and vague abdominal discomfort. There is usually some loss of weight, but this is not a marked feature. Attacks of wind with colicky pains occur with some exaggeration, for the time being, of the gradually increasing constipation which may be, but is not necessarily present. The discharge of fæcal-stained mucus (false diarrhœa) and blood, characteristic of rectal cancer, is uncommon. The actual attack of acute obstruction occurs rather suddenly and is often preceded by a few days' increased difficulty with the bowels. Severe and diffuse abdominal pain with some nausea or actual vomiting indicate the beginning of the crisis. One loose motion may occur as the bowel distal to the growth empties itself, but after this constipation is absolute and no flatus is passed. The patient looks ill, with sallow complexion, dark hollows round the eyes, sunken cheeks and zygomatic fossæ, and foul tongue and breath. The pulse is frequent and of poor volume, the temperature possibly subnormal. If vomiting occurs, bile-stained or fæculent-smelling fluid floods up into the mouth with little apparent effort. The abdomen is distended and, if the walls are wasted, coils of intestine may be seen undergoing irregular peristaltic movements which possibly subside always in one situation, the actual site of obstruction. The abdomen differs from that of a general peritonitis in that it is neither rigid nor tender. There may be local rigidity and tenderness over the site of the growth, but the latter is seldom palpable through the distended abdomen. Occasionally a large lump, *freely movable from side to side*, may be detected in the cæcal region. The preceding few months of abdominal discomfort culminating in the sudden attack of absolute constipation, which cannot be satisfactorily relieved by repeated enemata (ox gall ℥ss ad Oj or turpentine ℥j ad Oj are the best to employ), makes the diagnosis of an organic obstruction certain. *In these circumstances an aperient should never be given.*

If rectal examination and careful inspection of the hernial orifices are negative, then a diagnosis of malignant disease of the colon is probably the correct solution of the problem. It must be remembered, however, that very similar symptoms, usually of longer duration, are produced by papillomata, often multiple and occurring in groups, and especially liable to produce attacks of recurring intussusception of the gut. Particular attention should always be paid to the femoral rings, in which situation it is easy to overlook, and, indeed, sometimes impossible to detect, a small strangulated piece of intestine in a stout patient.

Principle Guiding Treatment.

The essential thing to remember in the treatment of these patients is that no matter whether they are operated upon or whether they are left alone, they will die inevitably unless full exit is given to the intensely toxic fluid filling the intestine. *Moreover, any attempt to excise the growth and perform an anastomosis at this time will be invariably fatal.* Not only will the intestine be unable to pass on its poisonous contents, but leakage, early or late, will occur at the new junction. A piece of bowel in an acute state of inflammation, sodden with œdema, with its thick hypertrophied muscular walls in a condition of great irritability, is most undesirable material to utilise for an anastomosis.

If the patient is desperately ill the quicker and simpler the operation, provided that it is effective, the better the prognosis. When there is a certain amount of asymmetry in the abdominal distension and a visibly distended cæcum coincides with a relatively flat left iliac fossa, a small incision in the right iliac region will suffice. The distended cæcum is not withdrawn from the wound but is carefully sutured to the parietal peritoneum, and a fair-sized Paul's tube fixed in the bowel. It is wiser not to attempt to pass an exploring hand into the abdomen. If, on the other hand, the abdominal distension is of uniform character and there is no evidence as to the site of the obstruction, a para-median incision below the navel may be necessary. A suitable piece of bowel on the proximal side of the growth is selected, one angle of the exploratory incision being utilised or a new small additional incision, made in an appropriate place, for the performance of a colostomy. The bowel is fixed to the skin and a Paul's glass drainage-tube sewn into it.

If the patient's condition is reasonably good certain alternatives are open to the surgeon, depending largely on the site and operability of the growth.

Growths situated in a Movable Part of the Colon.

Operable growths situated in a movable part of the colon, such as the transverse or pelvic portion, are best treated by Paul's operation. A considerable loop of bowel containing the growth in its convexity is brought completely out of the abdomen and fixed either in the exploratory opening or in another one suitably planned. A thick mattress suture passed through the mesentery of the exposed loop from edge to edge of the incision and two fixing stitches at the angles of the wound will suffice for this purpose. If the colon is not sufficiently mobile to allow of this being done without tension, much can be effected by an incision through the lateral layer of its mesentery, where the latter is reflected on to the parietes, and the gradual stripping medianwards of the bowel and median leaf of the mesentery, carrying vessels and lymphatics, with fingers and gauze. A Paul's tube is sewn into the proximal limb of the U-shaped loop. One week or ten days later, when the patient has recovered from the immediate effects of the acute attack, the loop of bowel and the exposed portion of its mesentery are cut away with cautery or knife. Three months or so later the resulting colostomy is closed by an extra-peritoneal procedure, which leaves the new anastomosis lying between the peritoneum and the deepest muscular layer of the abdominal wall. This method is by far the safest of any. It may be urged that a grossly inefficient removal of the mesentery and its possibly infected lymphatics is secured, and this cannot be denied. In practice, however, it is an operation which is found to give most satisfactory results.

Growths situated in a Fixed Part of the Colon.

The cases in which Paul's operation is not suitable may be divided into two classes: (*a*) Those in which on exploration the growth is found to be an operable one—i.e., a movable tumour without evidence of

tensive lymphatic infection or other metastasis; those in which the growth is inoperable.

(*a*) In operable cases the bowel must be at once lieved by some variety of colostomy or cæcostomy. aring in mind that the growth will have to be sected and an anastomosis performed through a nvenient incision made directly over it some two to ree weeks later, the site of the drainage operation ll be so designed that it is some distance away from is point. The advantage of cæcostomy over lostomy is that if, in the former, the gut is merely ed to the peritoneum and not to the skin of the dominal wall, there is quite a reasonable chance at the fæcal fistula will close spontaneously at a later ite, when its services are no longer required. In old atients and in those whose tissues are in a poor state nutrition, a third and fairly simple operation may ve to be performed for its closure.

(*b*) In cases where the growth is inoperable, the oice lies between short-circuit and colostomy. The tter is undoubtedly the safer procedure, and where a ft inguinal or transverse colostomy is possible, this ould be done. In cases in which a cæcostomy alone ould be effective (i.e., growths of the ascending colon hepatic flexure), the surgeon, thinking of the future id the intense discomfort of a permanent cæcostomy ith fluid contents leaking continuously, will probably cide upon some form of short-circuit. If the bowel not too greatly paralysed the risk to life of this ocedure will be more than compensated for by the eatly increased future comfort of the patient. The orter the stagnant loop of the short-circuit, the tter will be the ultimate result.

In these external drainage operations the intestinal ntents will usually at once begin to flow away, but in unsatisfactory amount calomel in doses of gr. ss ould be given every hour until the desired result is btained. The skin around a cæcostomy suffers from e toxic fluid which pours over it continuously, and ould be protected by a thin smear of ung. zinc oxid. ade sufficiently fluid by the mixing into it of a little stor oil.

Harold W. Wilson, M.S. Lond., F.R.C.S. Eng.,
Surgeon, with Charge of Out-patients,
St. Bartholomew's Hospital.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. E. F. Ellis is placed on the ret. list with the nk of Surg. Capt.

Surg. Lt. H. Hurst to be Surg. Lt. Comdr.

ROYAL ARMY MEDICAL CORPS.

Lt. C. A. Hutchinson to be Capt.

Temp. Capts. relinquishing their commns. and retaining e rank of Capt.: A. S. Blackwell and G. A. Shiel (on ccount of ill-health).

TERRITORIAL ARMY.

Capt. J. M. MacKenzie, R.A.M.C., to be Div. Adjt., 0th (Northumbrian) Div., vice Capt. (Bt. Maj.) R. E. arnsley, R.A.M.C., vacated; and Capt. J. D'A. Champney, .A.M.C., to be Div. Adjt. 53rd (Welsh) Div., vice Maj. . White, R.A.M.C., vacated.

Capt. J. C. C. Howe (late R.A.M.C.S.R.) to be Capt.

Lt. J. Cohen, from 13th Bn., The Lon. R., to be Lt.; and . C. Crawford to be Lt.

ROYAL AIR FORCE.

E. G. Howell is granted a short service commission as light Lt.

Lt. G. A. Ballantyne, Dental Surgeon, General List, rmy, is granted a temporary commission as a Flying fficer on attachment to the R.A.F.

Manchester Royal Eye Hospital.—This hospital has been in existence for 109 years and at the annual meeting the report for 1923 was presented. During the year the out-patients numbered 30,502 and in-patients 046, while the accidents which necessitated treatment at the hospital averaged 23 per day. Various donations and bequests received during the year enabled the managers to reduce the bank overdraft from £9000 to £3000.

Special Articles.

THE CAPITATION FEE FOR INSURANCE PRACTICE.

Concluding Sessions of the Court of Inquiry.

The Court of Inquiry appointed by the Minister of Health to determine the capitation fee to be paid to insurance practitioners from Jan. 1st, 1924, held its concluding sessions at the Ministry of Health on Jan. 15th and 21st. The Court was mainly occupied with the evidence submitted on behalf of the approved societies. The members of the Court are Mr. T. R. Hughes, K.C., Chairman, Mr. F. C. Goodenough, and Sir Gilbert Garnsey, K.B.E.

Tuesday, Jan. 15th.

Before the evidence on behalf of certain individual approved societies was taken, Mr. H. F. Jeffrey, Secretary to the Scottish Board of Health, made a further statement regarding contract practice in Scotland. He said that the fee to be paid to doctors for the treatment of miners' dependents had been reduced, as from that day, from 4½*d.* to 4*d.* a week. There was a material difference between the apparent and actual pay which a doctor got for this class of work. There were many unpaid contributions owing to unemployment and there were also the management expenses of the clubs which were a first charge on the contributions and represented about 2½ per cent.

In his reply Dr. Cox stated that the agreement with the miners provided that full contributions should be paid during times of unemployment. There was a medical examination before entry into the scheme; and extra charges were made for special services and expensive drugs. The insured person, assisted by grants from the Exchequer, was in a position to pay an economic rate to the doctor, but this was not the case with many of the dependents.

The National Deposit Friendly Society.

Mr. Tuckfield presented the case for the National Deposit Friendly Society, which claims to be the largest centralised friendly society, having nearly 2300 branches throughout the country with a total membership of 445,000 insured persons and 600,000 deposit members. As regards the medical benefit provided to members outside the national insurance scheme the society did not appoint doctors; they allowed members to select any registered practitioner and made an allowance (based on a scale of charges) in respect of the medical treatment actually received. From 1911 to 1919 the scale for medical attendance and two days' supply of medicine had been 2*s.* 6*d.* for a visit at the patient's house and 1*s.* 6*d.* for a surgery attendance. In 1919 the scale had been increased to 3*s.* 6*d.* and 2*s.* 6*d.* respectively. For a further two days' supply of medicine an extra allowance of 1*s.* 6*d.* was made. Replying to questions by the Chairman, Mr. Tuckfield said that his society had no complaint to make as to the medical attention which had been given to their National Insurance members. They had, however, to deal with complaints of inadequate surgery accommodation, the improper charging of fees, and the giving of irregular certificates. He could not say how many of their 445,000 members had complained. In reply to Dr. Brackenbury, witness said that probably not more than 5 per cent. of the doctors' bills received by members were in excess of the scale authorised by the society.

Dr. Gordon Ward pointed out that, as it was customary to prescribe a four days' supply of medicine, the scale of fees really amounted to 5*s.* and 4*s.* for a visit and surgery attendance respectively. Sir Thomas Neill replied that if one allowed 1*s.* 6*d.* for the first two days' medicine the fee for the actual medical attendance was only 2*s.* and 1*s.* respectively

Northumberland and Durham Miners.

Mr. E. Harrison gave evidence on behalf of the Northumberland and Durham Permanent Relief Fund Approved Society, which had a male membership of 98,000. The society's evidence stated that the present service was satisfactory and equalled that given by general practitioners to the same class of patients in pre-insurance days. The majority of panel doctors gave their patients the full benefit of their knowledge and experience and could not give more. The regulations fully safeguarded the interests of both the doctors and the insured persons. The medical service, as a whole, was quite satisfactory, and the ranks of the panel practitioners were largely filled by men whose skill, character, and attention were all that could be desired. During the past three years the society's officials had visited 13,000 members in receipt of benefit and in no case had there been any complaint against the doctor. There were occasional complaints as regards surgery arrangements, and the difference in the standards of treatment given to insurance and private patients, but the complaints frequently arose out of circumstances over which the doctors had no control.

Certification was not satisfactory. He did not suggest that the doctors had any intention to mislead the society, but in fact the doctors did in many cases fail to give an absolutely true certificate. He admitted that it must sometimes be difficult to say whether a patient is incapable of work, but he thought that all doctors did not fully appreciate the seriousness of a false certificate; his main desire was that doctors should refuse to issue irregular certificates at the request of their patients.

As regards the amount of the capitation fee, witness entirely disagreed with the Minister's figure of 8*s*. 6*d*.; he thought that was too high; it was based on the figure of 7*s*. 3*d*. which was, in his opinion, wrongly fixed when the Insurance Act came into operation. His experience of pre-war contract practice suggested that the usual fee was 4*s*. with medicines. He thought that too low a figure, and he would assume a pre-war fee of 4*s*. 6*d*. to 5*s*. to be fair; applying the calculations of the Insurance Acts Committee that would be equivalent to a fee of from 6*s*. 7*d*. to 7*s*. 4*d*. to-day. He suggested that a fee of 7*s*. was sufficient to build up a fund which could provide an adequate medical service throughout the country. He would be satisfied, if necessary, with a gradual reduction of the capitation fee spread over a term of years. Replying to the Chairman, witness said that they accepted the Ministry's figures of 3·5 services per insured person per annum as an average throughout the country. The figures for his society were 2·3 attendances and 3·1 visits, a total of 5·4, but this included many compensation cases. On these figures, and assuming a capitation fee of 7*s*., a doctor with 1500 patients would give 27 attendances on 300 days a year for a gross income from insurance practice of £525. In reply to Dr. Brackenbury, witness admitted that even the figure of 5·4 services per year referred only to attendances on persons who were incapacitated. Dr. Brackenbury suggested that, at a low estimate, an equal number of surgery attendances must be given to persons not incapacitated; this gave a total of 7·7 services per year; although the service figures in colliery areas were known to be high, the profession suggested that that must be taken into account in determining a uniform fee for the country. In colliery districts there was often little or no private practice.

Pre-Insurance Contract Rates.

Mr. George Wright gave evidence on behalf of the National United Order of Free Gardeners Friendly Society. He said that his society had branches in different parts of the country and that, prior to 1912, they had provided medical treatment and medicines to their members at contract rates which varied from 2*s*. 6*d*. to 5*s*. per member per annum, with an average of 3*s*. 11*d*. With few exceptions the doctors had been very satisfied with that rate. The contract rates paid at present for attendance and medicine to members who were not insured persons varied widely in different districts; thus, in East Yorks alone the rate for adults varied from 4*s*. 9*d*. to 13*s*. 6*d*. In Lancashire it was from 8*s*. 6*d*. to 13*s*. in Northamptonshire and Staffordshire it was 10*s*. He could not say why the rate varied so widely; in some cases, no doubt, the doctors were particularly considerate. The treatment given under the national insurance scheme was, in his opinion, an improvement on the pre-insurance contract practice. He thought that regard should be had to the large number of insured persons who were not on the list of any doctor, yet in respect of whom capitation fees were, presumably, paid into the Central Pool. Thus, in Cheshire alone, 22,133 insured persons had failed to be placed on an insurance doctor's list. It was very probable that many of these were actually receiving treatment from insurance doctors as private patients. As to the amount of the capitation fee it should be remembered that the capitation fee was an average fee to be paid for an average service. The approved societies desired to see the profession properly paid, and the insurance work done by satisfied doctors, but this result should be attained without payment of an unreasonably high fee; in his opinion it should not be higher than 8*s*.

Dr. Cox, in the course of examining the witness, stated that from 1903 to 1910 the British Medical Association had engaged in most active controversy regarding the low contract rates which had been quoted; the doctors, had, at that time, expressed their dissatisfaction most actively. As to the suggestion that insured persons were being treated by panel doctors as private patients, the regulations expressly forbade that, except in two cases—where the insured person deliberately renounced his right to benefit and expressly demanded to be treated as an insured person, or where, being on a doctor's list and not wishing to change, he went to another doctor and asked for a second opinion or advice for which he wished to pay.

The Trade Union Approved Societies.

The case of the National Association of Trade Union Approved Societies was presented by Mr. Canter, President of the Association. Mr. Canter said the Association had one and a half million members and represented nearly every trade-union. The Association regretted that the Terms of Reference of the Court did not refer to the amendment or extension of the medical service under the insurance scheme; the trade-unions had pressed for a wider service, to include specialist treatment. The view of his Association was that for the medical treatment which was required under the new regulations the doctor would be adequately remunerated by a fee of 7*s*. 3*d*. Although the time at their disposal had been limited, the Association had collected figures from 1300 doctors practising in 250 different towns and areas; and these figures showed that in many cases the doctors did not charge their private patients more than 3*s*. 6*d*. for a visit and 2*s*. 6*d*. for a surgery attendance. This fee gave about 10*s*. for 3·5 services and a deduction of 7½ per cent. for bad debts brought the figure to 9*s*. 3*d*. A deduction for the cost of medicines must then be made. Their figures showed that in 2·8 of the 3·5 services medicines were supplied and the statistics of the South-Eastern District Pricing Bureau showed the average cost of prescriptions to be 8·7*d*., or 2*s*. for the 2·8 prescriptions. The 10*s*. of private practice was thus equivalent to 7*s*. 3*d*. for 3·5 insurance services. He believed that the treatment given to private patients at the fees quoted was as good as, and sometimes better than, the treatment given to insured persons. A customary contract rate for dependents was 1*s*. 8*d*. a month and this covered, on the average, the wife and two children under 16. Allowing the 2*s*. deduction for medicines, this represented a yearly fee of 4*s*. 8*d*. a head. His Association contended that unless and until there were very considerable extensions and

improvements in the medical service provided to insured persons, the medical profession had no claim for a higher fee than he had proposed. They did not agree that the fee paid should be sufficient to attract the higher skilled practitioner to undertake health insurance work unless the insured population were guaranteed this higher skill; in their opinion this could not be expected from the average practitioner who undertook insurance work. They contended that in order to secure this higher skill some alteration in the flat rate method of payment was necessary, or the flat rate should be supplemented by special payments to secure the skill of the better qualified practitioner.

In reply to questions by Dr. Brackenbury witness agreed that doctors had, on the whole, acted considerately to poor persons. The leaders of the medical profession might desire to give a full and adequate service, but he doubted whether the profession as a whole was in a position to give it. The figure of 5 services per person per year had been accepted from the Ministry's case, and had not been verified by independent investigation. He admitted that the private fees quoted did not include certain services within the insurance agreement; and that the Drug Fund supplied insured persons with drugs and appliances for which the doctor would make an extra charge to his private patients.

In reply to Dr. Ward witness admitted that the 8s. 6d. and 3s. 6d. quoted for private practice was not necessarily the maximum fee which a doctor charged.

Mr. Corbey, Secretary of the Association, in supporting Mr. Canter's evidence, said that for the purpose of compiling the figures on which the Association's case was based he had personally visited many districts, interviewed many people, and inspected many of the actual doctors' bills.

Certification Complaints.

Mr. W. Rigby gave evidence on behalf of the Catholic Friendly Societies and Catholic Approved Societies Associations. He said that the approved societies which he represented were not satisfied with the action of panel doctors with regard to certification. A looseness of certification was current which lowered the whole tone of medical benefit and seriously damaged the funds of approved societies. He thought that irregular certification had in many instances tended to put into the background the primary need of curing the insured person. They were now insisting on a closer medical examination, and were obtaining the assistance of the regional medical officers. Witness quoted instances where the R.M.O. had disagreed with a high percentage of certain doctors' certificates.

Dr. Brackenbury inquired what reduction in the capitation fee would, in the witness's opinion tend to produce more careful certification.

Continuing, the witness said that many insured persons received treatment in hospitals. The figures from 15 areas showed that out of 10,000 members 2159 were on the funds receiving 18,500 weeks' benefit, of which 2500 weeks—nearly 1 in 7—represented hospital treatment.

The Chairman inquired whether it was not often difficult for the doctor to act fairly as between the approved society and the insured person on questions of certification. Witness admitted that it was so, and said that in the north of England many doctors had told him that it was very difficult to refuse to issue certificates at the request of insured persons without endangering their practice.

The Seamen's National Insurance Society.

Mr. Godfrey said that the Seamen's National Insurance Society was the only society which dealt directly with the doctor for insurance purposes. The object of the Society was to provide medical treatment to seamen while they were on shore, and this was done by means of the fee system. The scale of fees drawn up when the Insurance Act came into operation had been increased by 20 per cent. in 1919 and by 50 per cent. in 1920, a reduction of 10 per cent. being made in 1922, a further reduction was now contemplated, but it was proposed to await the decision of the Court before deciding its extent. The present scale was 3s. 6d. for a visit and two days' medicine and 2s. 1d. for a surgery attendance and medicine, with special payments for night visits, mileage, and special services.

Throughout the 11 years during which the Society had been established they had nothing but praise for the way in which doctors had given treatment; they had attended the seamen in a most sympathetic manner.

Mr. Chambers, on behalf of the National Sailors' and Firemen's Union, said that during a period of three weeks, 1600 members had sent in certificates of incapacity, and of these 306 were hospital certificates. He suggested that, as the capitation fee would be paid in respect of all insured persons, account should be taken of the large number who did not trouble the panel doctor while in hospital.

The Experience of Welsh Societies.

Mr. Rowland H. Jones, secretary of the Denbighshire Association of Approved Societies, said that in his experience the medical service since 1912 had improved each year in South Wales, but it was not yet satisfactory. Many doctors did not give equal treatment to their insurance and private patients. Certificates were often loosely given, particularly at the beginning and at the end of an illness. In some instances 50 per cent. of the cases referred to regional medical officers showed incorrect certification. He thought that more might be done to relieve the insured person from having to walk a long distance, sometimes ten miles to the surgery; there might be a weekly examination at a suitable village centre. His experience on the Medical Service Subcommittee for Denbighshire showed that the medical members acted very fairly; the decisions of the Subcommittee had always been unanimous. He had met many cases where the insured person had refused to put in complaints. As to the amount of the capitation fee, he thought that 7s. 6d. was sufficient, although he would not object to 8s.; this would represent an increase of 100 per cent. on the normal pre-insurance contract figure of 4s. For doctors in rural areas an additional payment should be made for mileage and, in his opinion, the existing mileage allowance should be increased.

MONDAY, JAN. 21ST.

The case of the Emergency Committee of the Provisional General Council of Approved Societies was presented under three headings: (1) Medical contracts, (2) certification, (3) medical benefit regulations.

Pre-Insurance Contract Practice.

Mr. William Wood (Secretary of the Scottish Rural Workers Approved Society) contended that practically no service had been rendered to insured persons who were not on any practitioner's panel and that the distribution amongst the panel doctors in each area of the capitation fees of these persons was practically a free gift to the doctors, which should be taken into account in fixing any general capitation fee. The figure of 3·5 as the average number of attendances per insured person per annum was arrived at from records kept by doctors themselves, and was regarded by the Society as unreliable, because in many cases the formal granting of a certificate of incapacity was recorded as an attendance.

The Chairman excluded a recommendation for a graduated scale of remuneration as being outside the scope of the inquiry.

Mr. S. L. Duff (Permanent Secretary, Ancient Order of Foresters) gave evidence on Part I. of the Committee's case. Prior to 1913, he said, most of the contracts between friendly societies and the medical profession provided for a capitation fee of 4s. including medicines. In certain respects, it was true, the present-day insurance service differed from the older club practice. Under the pre-insurance contract

system, certification was simpler and such record keeping as was required was of an elementary character; there was also a process of health selection, but this had been greatly exaggerated; sometimes men up to the ages of 21, 25, or 30 were admitted without medical examination. Apart from these factors the medical benefit was substantially the same as under the present insurance agreement, and he thought that the sudden rise in the doctors' remuneration from 4*s.* with medicine to 7*s.* 3*d.* without medicine was entirely unjustified. An initial mistake had, he believed, been made in fixing the doctors' remuneration when medical benefit under the Insurance Act first became operative, and this error had continued in each subsequent settlement. It was fortunate for the doctors that, at the time of the 1912 settlement, the fortunes of the Chancellor of the Exchequer were bound up with the success of the Insurance Act. Almost on the eve of the commencement of medical benefit the British Medical Association—who were great organisers—had advised the doctors to refuse service, and it was only as a result of this that the high fee of 7*s.* 3*d.* had been paid. As regards the 1920 arbitration, witness suggested that it would be difficult for the arbitrators entirely to dismiss the original figure of 7*s.* 3*d.* from their minds, and so the original error had been continued. Had the award been postponed for even two months he thought a lower fee would have been fixed, as by then the nation had recovered the economic perspective which was lost in the years after the war. His committee maintained that even if the medical service offered to insured persons was perfect within the compass of the regulations, the capitation fees fixed in 1913, 1920, and 1922 were excessive. The present Court had an opportunity to apply a corrective to the initial error.

Mr. W. Marlowe, Secretary to the National Conference of Friendly Societies, said that his Conference represented 69 district societies with 7,420,000 voluntary members. He claimed that the actual remuneration received by the doctors for their attendance on friendly society members in pre-insurance days provided a clean jumping-off ground for determining the capitation fee for insurance practice. In 1898 the General Medical Council had convened a Conference with representatives of friendly societies and nothing beyond a capitation fee of 4*s.* including medicines had even been suggested. In 1908 the British Medical Association had convened a Conference, and there had been no expression of dissatisfaction with the contract terms of the friendly societies. That being so, he did not see why the fee should jump to 7*s.* immediately the Insurance Act came into operation. Under the old friendly society régime the relations between the doctor and the patients were sound and good and the doctors had been kind and generous; the relations with the societies, too, had been pleasant, and the doctors had been anxious to undertake the work. He contended that the 4*s.* was the right figure from which to start, and that allowing for the altered conditions of living, 7*s.* 3*d.* was all that should be paid at the present time, not a penny of this to come from the funds of the approved societies. The approved societies wished to be friends with the doctors; but he thought that the doctors had a low opinion of the friendly societies.

Dr. Cox said that he could assure Mr. Marlowe that the doctors had no such low opinion of the societies as he suggested, but it was sometimes difficult for them when the societies themselves had such a low opinion of what the doctor's work was worth. If the doctors were completely satisfied with the pre-insurance friendly society practice, why had the profession refused to work the National Insurance Act under the ægis of the friendly societies? Mr. Marlowe, having replied that it was because the profession desired to obtain complete control, Dr. Cox quoted the opinion expressed to the profession by Mr. Lloyd George in 1911 that in this respect they had a legitimate grievance. In reply to further questions by Dr. Cox, Mr. Marlowe said that the only certificates required in friendly society practice was a declaring on and declaring off certificate; no records had to be kept by the doctor, and members were usually admitted only after medical examination.

The Chairman indicated that the Court would not give undue weight to what happened before 1911.

Mr. G. L. Lingstrom, Past Grand Master of the Manchester Unity of Oddfellows, said that the original capitation fee of 7*s.* 3*d.* was obtained because the profession took undue advantage of the needs of the community, by threatening to refuse service under the Insurance Act. In his opinion 7*s.* 3*d.*, which represented an increase of 3*s.* 3*d.* on the old friendly society rate of 4*s.*, was adequate; the doctors should be paid an economic rate, based on the rate which was customary before they received assistance from the State. The old friendly society service was satisfactory to the members, and the relationship between the society and the doctors had been good; yet as soon as the Insurance Act came into operation the doctors raised their fee from 4*s.* to 8*s.* 8*d.* for private contract work. The service available to the insured person might, perhaps, in some respects, be better than the earlier club service—e.g., as regards expensive drugs and appliances, but as regards the services given by the doctor it was not better. In reply to the Chairman, witness said that the figures for 53 branches showed that the fee paid to the doctor in respect of non-insured members varied from 8*s.* to 20*s.*, with an average of 12*s.* 6*d.*; the figures for 23 medical institutes showed fees ranging from 6*s.* to 16*s.*, with an average of about 8*s.* 6*d.* All these rates were influenced by the original excessive insurance fee of 7*s.* 3*d.*

Certification.

Mr. J. P. Lewis, Secretary of the Hearts of Oak Benefit Society, said that the number of certification cases which came before insurance committees offered no criterion of the extent of irregularities. Although only 1339 cases had been dealt with since 1920, the pitiable point was that 60 per cent. had gone against the doctor. Sickness benefit became payable only at the beginning of 1913, yet in August of that year a departmental committee had to be appointed which had resulted in the establishment of regional medical officers. Information recently collected by societies representing more than one-half of the insured population of Great Britain, showed that out of a total of 56,107 cases referred to R.M.O.'s, during the first six months of 1923 14·5 per cent. cases were fit to work, 44·8 per cent. cases were unfit, and in 40·7 per cent. cases the insured person failed to attend. Most of those who failed to attend would have been declared fit since the date of citation. Out of one group of 41,836 cases referred, 18,335 failed to attend and investigation showed that 16,871 of these had declared off prior to the date fixed for examination, only 1464 being actual failures to attend. Of 15,201 cases found incapable of work or declared off, 588 were those of members who had been furnished with monthly certificates of incapacity.

In reply to the Chairman, witness said that he appreciated that certification as to incapacity was often a difficult matter for the doctor. The appointment of regional medical officers had worked some improvement: whether it would result in further improvement depended on whether the doctors took to heart the lessons to be learned from the cases referred to R.M.O.'s.

Mr. E. F. Spurgeon, National Conference of Industrial Approved Societies, said the funds of approved societies were the property of the members, and references to R.M.O.'s were, therefore, solely in the members' interest. Applying their experience to the figures of the Ministry of Health, out of 107,242 references to R.M.O.'s it might be assumed that 53 per cent. had been found fit to work. The approved societies were anxious to coöperate with the doctors; and they did, in fact, receive coöperation from a large number of insurance doctors. He considered that the certificate should enable the society to satisfy itself from the health point of view that the member was

tually incapable of work. The societies did not fer cases to the R.M.O. until the member had been for four weeks and then only on the recommenation of one of their medical officers; thus six or seven eeks would usually elapse between the beginning of ie illness and the R.M.O.'s examination. On many rtificates the cause of incapacity was insufficiently ated; there was a tendency to certify sickness rather an a specific disease. He thought that much of the ose certification was due to careless and cursory camination of the patient; thereby adequate treatent might not be provided, and the patient's covery might be postponed. He hoped that the rofession would realise that the approved societies sired to extend coöperation to every doctor on the anel.

The Range of Service.

Mr. H. Lesser dealt with Part III. of the Committee's se. He denied that greater obligations and sponsibilities had been imposed on the doctors since 913. Section 15 of the National Insurance Act, 1911, rovided that the arrangements to be made by surance committees should be such as to secure dequate medical attendance and treatment from surance practitioners; that must mean treatment dequate to the general purposes of the insurance heme; and from that standpoint the doctors were equired to do no more in 1924 than in 1913. The ew definition of general practitioner treatment did ot extend the range of service; it altered the wording ot the substance. The provision as to surgery ccommodation and practice arrangements were ecessary only to enable action to be taken in exceptional cases, but did not increase the obligations of the octor. The doctors had, moreover, always accepted he principle of collective responsibility, and had eceived remuneration for this; thus, in the London rea, the 11*s.* capitation rate had actually produced 1*s.* 6·94*d.*, while the 9*s.* 6*d.* fee had given 9*s.* 10·2*d.* nd 9*s.* 7*d.* in 1922 and 1923 respectively. As regards heir certification obligations the doctors seemed to uggest that their only duty was to their patient, but his was an entire misconception; in the administration of benefits under the Insurance Acts the loctors and the approved societies were correlated. The supposed additions to the doctor's obligations vere all included in the general requirement of an dequate service, and while this overriding provision f the Act remained, he thought that the Court should lismiss the doctors' claim.

The Societies' Case Concluded.

Sir Thomas Neill concluded the case on behalf of the pproved societies. He said that if one considered the ctual details of the work of a large approved ociety involving, for example, 69,000 claims a year, vith special reports in 25,000 cases and the provision f treatment for 6000 tuberculous members, it would e realised that those associated with approved ocieties were actuated only by motives of national ervice. They desired to do all that they could to lift p the service, and for that purpose they wished to e able to talk over matters with the doctors. They lid not want to feel that the doctors were so high and nighty that they could not enter into mutual discussions. The "hands off" attitude adopted by the rofession with regard to a service towards which the State contributed was, in his view, most undemocratic.

Further evidence might have been submitted by his ide regarding the time rate equivalent. It was not lear that the records on which the Ministry's figure f 3·5 services per insured person was based excluded ttendances in respect of confinements, neither did hey know to what extent the correctness of the ntries on the records had been checked. There were, n an average, 3500 insured persons in hospital; the doctor was not at risk at all as regards these. There were, also, many persons who had not selected a doctor; assuming the number to be 10 per cent., it represented £750,000 even at the 7*s.* 3*d.* capitation fee. He hoped that the Court would, in the interests of all parties, be economical in their decision: they had arrived at the stage when inflated payment for services of this kind could not be maintained.

Mr. Abbott informed the Court that the annual report of the Minister of Health showed that the number of insured persons who had not selected a doctor was only 5·2 per cent.

Dr. Ward, on behalf of the Medical Practitioners' Union, in the course of a further statement expressed the view that the figures on which the Ministry's calculations were based were not those of an average practice; and he doubted whether the figures had been taken from a proper proportion of town and country practices. The average salaries of regional medical officers had shown progressive increases from 1920 to 1922, yet the insurance doctor's remuneration was to be decreased. He thought that the present certification rules exceeded what was necessary. The obligations of insurance practitioners were bound to increase and therefore any capitation fee decided on should not be reduced if recommended for a term of years.

The Reply to the Societies.

Dr. Brackenbury replied to the case of the approved societies. He said that he did not propose on that occasion to deal with the many detailed points which had been raised. He confessed a difficulty in seeing the relevance of much of the evidence. The approved societies contended that the doctors should receive less because the service was not as complete as was desirable. He sympathised with that view; the profession would like to see a service which would include everything which the insured person could need; but it was surely begging the question to say that the doctor's remuneration should be reduced because there was not that full service; the question was the value of the service which was in fact being given. The profession did not complain of the increase in their responsibilities since 1913; they had themselves suggested many of them, but they did claim that in certain important respects—e.g., the provision of emergency treatment and the administration of anæsthetics at specialist operations, additional duties had been laid upon them, and that the value of those services must be assessed. It was said that the fee should be reduced because the area of the doctor's responsibility was limited by the number of insured persons who had not selected a doctor. That argument showed an amazing ignorance of the principles of insurance. Because under an insurance scheme there were liabilities which did not mature, it was surely wrong to suggest that those liabilities should be borne for nothing. It was entirely wrong to assume that all insured persons treated in hospitals were cases which the insurance practitioner ought to treat; they were mostly cases falling outside the insurance agreement. In smaller towns, moreover, the hospitals were staffed by the local general practitioners. It was said that many of the doctor's duties, such as the writing of certificates, were trivial, yet the societies attached great importance to certification and said that it should be carried out with great care. Dealing with the suggestion that the fee should be reduced because the service rendered by the doctors was not a good one, Dr. Brackenbury was proceeding to quote the evidence of the Ministry and of the insurance committees, when the Chairman observed that the Court would not regard any defect in the service except in relation to certification upon which specific allegations had been made.

On the question of certification, Dr. Brackenbury said that it was quite wrong to assume that there was necessarily incorrect certification in all cases where insured persons were declared off between the date of citation and the day appointed for examination by the R.M.O. It was only natural that the cases referred by societies should be mainly those where the patient was getting near the end of an illness and would therefore, in any event, have been certified fit for work before the date of the R.M.O.'s examination. It was often a matter of real difficulty to say definitely that a patient was unfit for work one day and fit on the next. The medical profession attached

considerable importance to certification; to sign a false certificate was a very serious thing for a medical man; neither did they wish to palliate lax certification. They recognised their duty in this respect, but it was an oppressive duty and had been placed on them over and above their duties to their patients; there was nothing comparable to it in private practice; and it must be taken into account in deciding the amount of capitation fee.

As regards the pre-insurance club practices, he accepted the evidence of the insurance committees that the insurance scheme offered a better service. He could not admit that the contract rate of 4*s*. was adequate, but even accepting that, it was to be noted that a customary service rate in those days was 1·25 services per member per year. Assuming a present day service rate of 3·77, even the 4*s*. rate would be equivalent to 12*s*. in insurance practice, less 1*s*. for drugs, but with an addition for certification, records, and increased range of service.

In conclusion, Dr. Brackenbury said that he could not believe that the approved societies seriously suggested that a reduction in the capitation fee would really improve the service available to insured persons, neither did he think the societies would desire that the pay from insurance work should be so low that the doctor would devote most of his time and interest to his private practice. The profession wholeheartedly desired that the insured person should receive as complete a service as is given to private patients, but to secure that it was necessary that the capitation fee should be comparable to the income derived from private practice.

In concluding the sittings of the Court the Chairman thanked all the parties for the excellent way in which they had presented their evidence. He hoped that the Court would be able to issue an early report.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Projected Insurance Scheme and the Medical Profession.

THE Chambre des Deputés has under discussion a new proposal with regard to an insurance scheme, a subject which is of topical interest to the English medical world. Under the proposed scheme insurance will be of two kinds, compulsory and voluntary. The first category includes all those persons whose income is less than 10,000 francs per annum, allowing another 2000 francs for each dependent child under 16. A levy of 10 per cent. is made on the basis of the income, contributed partly by the employer and partly by the employee, and in return the insured person may claim medical treatment and drugs for himself, his wife (if not a separate wage-earner), and his children. A daily allowance amounting to half the regular salary is made in case of illness, and for disablement a pension of 500 to 3000 francs, according to the scale of the contributions, is allowed. A further allowance is made to wives during the three months preceding and the three months following childbirth, while obstetric treatment is provided free. The number of wage-earners affected by the compulsory insurance is estimated at 12,000,000, including wives and children. In addition thereto farmers, artisans, small employers, and small merchants are eligible, provided that they are not more than 30 years of age and free from any chronic malady. It has been decided to place the administration of the funds in the hands of mutual benefit societies. Insurance societies are authorised to make contracts for medical service with the doctors, on condition that the following three principles are maintained: (1) free choice of doctor by the insured party; (2) collective contract; (3) adoption of part-payment coupons. Free choice of doctor is, however, limited to such medical men as have signed a collective contract with a society, and as the society will naturally endeavour to contract at the lowest possible capitation figure, the contract doctor will be obliged to enrol a clientele of unwieldy proportions. The part-payment coupon is designed to circumvent abuses of the society's funds by laying a small charge directly on the insured person for all medical treatment he receives, but it is doubtful if the object desired will be achieved. The main objection to the working of the law is that the interests of the insurance societies will be constantly opposed to the doctors' professional interests; the detection of malingering will be of greater moment from the society's point of view than careful ministration to the sick. In view of the unanimous protests of the organised medical profession the Bill has been submitted for revision, but will shortly be laid before the Chambre, which will doubtless make it a plank in the forthcoming election platform. French medical opinion is not concerned with the political aspect of the question. Its sole object is to consider the insurance scheme from the point of view of the medical profession in maintaining a high standard of technique and efficiency.

Instruction in the Technique of Sanitation.

As provision for practical training in sanitation has hitherto been lacking in France, the Under Secretary of State for Technical Education has added to the National Conservatory of Arts and Crafts an Institute of Sanitary Technique, open to all whose studies or whose profession demand a scientific knowledge of sanitation. Duly matriculated pupils may obtain a diploma in sanitary technique on satisfying a board of examiners. Non-matriculated pupils who do not wish to qualify may attend the lecture courses on application to the Director of the Conservatory. The training will be free, and the complete course will not exceed three months, in order to allow candidates who do not live in Paris to complete their studies in the shortest possible time. The course will include theoretical lectures, practical demonstrations, and visits which will occupy the whole of each day. At the opening of this institute, which took place recently, the director, Mr. F. Heim, outlined the purpose of the work. "The object of the institute," he said, "is to give engineers, architects, builders, and all others who are concerned in matters of hygiene an opportunity to acquire knowledge which will enable them to embody sound hygienic principles in their constructive work, and thus further the material welfare of the community."

Hygienic Measures following the Floods of Paris.

During the recent floods the Parisiens suffered more from apprehension than from the realisation of their fears. The waters of the Seine remained at 25 cm. below the flood level of 1910, but these 25 cm. spared Paris the disasters of 14 years ago. From the medical point of view, the unfortunate happenings which were recorded in THE LANCET of Feb. 5th, 1910, have not been repeated on this occasion. Only a very circumscribed area of Paris, in the seventh arrondissement, was deprived of electricity, but no damage was caused either to hospitals or to hospital installations. Refugees who were forced to leave their dwellings were allocated to empty military buildings situated on the fortifications. The Ministry of Hygiene instituted a daily medical visit to each of these buildings, and provided a staff of nurses to care for the sick, the convalescent, the mothers, and the children. The population of Paris was warned, by means of a circular, not to drink water from public fountains or wells unless it had been boiled or otherwise purified. Other sanitary provisions were as follows. Wells and cisterns must be cleaned and disinfected (500 g. of calcium or potassium permanganate per cubic metre of water to be disinfected). Conduits must be examined, and where polluted by infiltration they must be put in order and cleaned. The consumption of uncooked vegetables has been temporarily proscribed; all foodstuffs which might

have been subjected to pollution must be cooked. Houses and outhouses are to be cleared of mud and filth, which must be deposited at a safe distance from any drinking water-supply. Plaster and lime, added to the mud, is recommended as a convenient drying method. Disinfection is carried out by carefully mixing about 5 kg. of quicklime with every cubic metre of mud. The floors of dwellings must be disinfected either by whitewash in the case of earth floors, or by thorough washing with an antiseptic solution (eau de javel, cresyl, warm lye, &c.) when the flooring is of wood. The same precautions must be taken with cellars and basements. Soiled mattresses must be burned and other bedding washed and disinfected. Schools, workshops, factories, and shops may not be reoccupied until such measures have been carried out. With these precautions no sudden epidemic or aggravation of sanitary conditions have been provoked by the floods.

Public Health Services.

SCHOOL-CHILDREN ON THE ISLAND OF LEWIS.

THAT conditions on the Island of Lewis are incredibly hard at the moment is borne out in the reports for 1922 and 1923 of the school medical officer, Dr. Agatha E. Miller. These islanders are always faced with the primitive struggle of wresting a living from the natural resources of their surroundings; the last three years have been lean ones, and there is now a strenuous fight for existence. Children's weight here fluctuates according to whether the harvest be good or bad, and there is an annual "spurt" in weight throughout the island after harvest. A good harvest in 1920 meant an increased average weight in the summer of 1921. A poor harvest in 1921 resulted in a decreased average in 1922. In 1922 the harvest was better again, and one would have expected improved weights in 1923. In this we are disappointed. The fishing and tweed failures, with the consequent loss of employment, have told against the children. "The outlook," writes Dr. Miller, "for the coming school year, with the wet season, the failure of the harvest, and the condition of the peat, is black indeed."

On entering upon school life the physique of these island children, who come of a noble, well-built race, gradually deteriorates. They enter school well above the normal in every way; indeed, in previous years the entrants have been very much above the average in weight, but as school years pass the children below the average increase in number. In districts specially dependent on the harvest the deterioration is greatest. Feeding experiments during the last three years in one large school demonstrated that this deterioration was dependent on want of food alone. The result of the provision of merely a cup of cocoa or soup at midday was that of 61 infants of 5 and 6 years of age not one was below 40 lb. in weight. With the stoppage of this midday soup or cocoa and failure of the harvest 13 per cent. fell below. Similarly, of 28 children of 12 years only 2 were under 70 lb. in weight and 50 per cent. fell below. The weight averages of boys of 5 fell from 45·56 lb. to 41·40 lb., and for girls from 47·38 lb. to 44·31 lb. Boys of 12 fell from 76·68 to 73·54, and girls from 79·13 lb. to 71·62 lb. In 1922, owing to the lack of funds and the inability of the parents to pay the necessary penny, the provision of a cup of hot cocoa at midday was stopped, and so grave is the present outlook that teachers all over the island are taking steps to raise the necessary funds for midday soup or cocoa. The distress is so general that it is feared that unless relief works of some kind are started all over the district within the next week or two the children will have to be fed from outside sources. The country children almost invariably belong to crofter fishermen, who welcome whatever casual labour they can get. Unfortunately there has been little or no work available for the last two years. The children of men who did not come back from the late war are conspicuous by their good clothing and superior nutrition. The rural population here differs from that in southern areas inasmuch as, having a hereditary right to the soil it is stationary, and fundamentally the race is good, as is demonstrated by the teeth. Two-thirds of the children examined had perfectly sound teeth. The majority of defective teeth was accounted for by the town children. No cases of rickets of long bones has been met with in Lewis for the last three years. Individual children removed to a home or even fed with the addition of oil at their own homes can easily put on a stone in weight in a month. The children, too, are clean. In the country districts vermin are few in number, though in the town this infection presents a serious problem. In Lewis altogether a wonderfully high standard of cleanliness is maintained. No dirty heads were noticed. The hair is usually washed weekly. All the water has to be carried from the well, as in country districts; even in the towns a number of houses have no water and few indeed have baths.

The result of an investigation into the social conditions in the black and white houses in Lewis is given in Dr. Miller's report. Evidently the feeding of these islanders is an urgent undertaking which should not be delayed.

Correspondence.

"Audi alteram partem."

THE PROMOTION OF MEDICAL HYDROLOGY.

To the Editor of THE LANCET.

SIR,—We desire your support in bringing before the profession the need for systematic teaching of medical hydrology, by which term is to be understood the science of treatment by waters internally and by heat, cold, and other agencies in baths and external applications. The General Medical Council have now definitely recommended that instruction in physical treatment should be included in the teaching of therapeutics, and we believe that the science of medical hydrology must be the foundation of such instruction. A joint committee of the International Society of Medical Hydrology and the Section of Balneology of the Royal Society of Medicine has been formed to promote the teaching of medical hydrology in England, and has already established a course of lectures on the subject under the London University Extension Board. It has further drawn up a statement and presented it to the Ministry of Health, pointing out how far we in England have fallen behind continental countries in this direction and how this state of things may be remedied.

Through the medium of your columns we now seek to inform the medical profession generally of our aims, which may be thus summarised:—

1. *Research.* The establishment and endowment of a central institute and laboratory for encouraging and co-ordinating systematic research into the physical and chemical properties and the pharmacological action of the British medicinal waters, and of the action and use of baths.

2. *Teaching.* Post-graduate; courses in London and at other universities. Students; inclusion of systematic lectures in the courses on therapeutics. Practical; study tours to British spas.

3. A complete *survey* of British medicinal waters.

4. Official *authorisation* of such waters. (Compare the official authorisation of drugs in the British Pharmacopœia.)

5. For the purpose of carrying out these objects, the establishment of a permanent *advisory committee* analogous to the French "Commission des Eaux Minérales."

Of the total working time lost by the population through illness, a very large proportion is due to chronic disease of the rheumatic type, which are more effectively treated by hydrological measures than in any other way. That this is already recognised in some quarters is shown by the voluntary contributions made to our great mineral water hospitals by

working-class organisations and other bodies responsible for the health of the poor. But it is not only the poor and the so-called working-class that need to be considered, for, as authorities have already pointed out, a great field of usefulness exists for such treatment at the health resorts in the early and preventive treatment of many diseases which seem to be peculiar to the strenuous life of to-day and which may perhaps be summed up as premature breakdowns. These conditions seem to affect particularly the brain workers of the nation, and their consequences, though less obvious, are perhaps of even greater importance than those previously referred to.

The importance of research and instruction in the treatment of these conditions, among others, needs no argument, and it is to effect this object that we are directing our efforts.

On behalf of the Committee,

We are, Sir, yours faithfully,

C. W. BUCKLEY,
W. EDGECOMBE,
R. FORTESCUE FOX,
R. G. GORDON.

36, Devonshire-place, W.,
Jan. 17th, 1924.

THE AURICULAR BEAT.

To the Editor of THE LANCET.

SIR,—Dr. G. Arbour Stephens raises an interesting point in his letter in your last issue as to the production of the sound, which we called the "auricular beat," by which we meant an exterior manifestation of the auricular contraction. Though there were 5 oz. of effusion in this case, in another, a boy of 14 whose ventricular rate for 24 hours before his death varied from 6–12 per minute, the auricular contractions were also well heard and there was no excess of fluid in the pericardium. In the case to which Dr. Stephens refers, the pericardial effusion was probably a terminal event; whereas the auricular beat, which was loudest at the earlier stage of the disease, had ceased to be evident for some weeks before death. The sounds corresponded absolutely to the auricular and ventricular contractions as shown by the cardiograph. Putting aside the question as to whether muscular action may cause vibrations audible as sound, one would consider that the sound manifesting the auricular contraction is produced in the same way as the third heart sound, and is due to a forcible contraction of the auricle driving the blood into the passive ventricle, thereby causing currents which close the auriculo-ventricular valve with varying degrees of force. It is also possible that if this closure is pronounced the shock might even be transmitted to the arteries.—I am, Sir, yours faithfully,

Wimpole-street, W., Jan. 21st. A. J. SCOTT PINCHIN.

EARLY HUMAN EMBRYOS.

To the Editor of THE LANCET.

SIR,—It would be kind of you to make known our pressing need for early human embryological material. An investigation is being made of the ductless glands and other organs of the human fœtus by members of the staff of the anatomical and histological departments of the London (R.F.H.) School of Medicine for Women. Up to the present the greater number of fœtuses received from our hospital and other sources are aged from 6 months upwards, the younger embryos being scarce. We should be grateful to any reader who could send us such material. The following suggestions for sending it are offered.

1. The fresh material should be fixed for at least one day before sending in 5 per cent. formalin made up with tap-water if normal saline is not available.

2. In complete abortions the sac should be carefully snipped to allow free entry of the fixing fluid.

3. Small embryos travel best in fixing fluid: the receptacle should also contain sufficient cotton-wool to prevent damage by shaking.

4. Larger embryos, after fixing for at least two days in 5 per cent. formalin, may be packed up with cotton-wool soaked in the formalin, and the whole wrapped in oil-silk or like material.

5. Material in central London districts could be called for on receipt of a telephone message to Dr. Lucas Keene at the London School of Medicine for Women between 9 A.M. and 5 P.M. any day but Saturdays and Sundays.

It is scarcely necessary to say how extremely important it is to obtain material as fresh as possible. A short history of the case, including age of mother, notes of previous pregnancies, also whether syphilitic or no, adds greatly to the value of the specimen. We shall be only too glad to report to the sender findings of any interest should he so desire.

We are, Sir, yours faithfully,

M. F. LUCAS KEENE.
E. E. HEWER.

London (R.F.H.) School of Medicine for Women,
8, Hunter-street, W.C., Jan. 21st, 1924.

IMMUNISATION AGAINST DIPHTHERIA.

To the Editor of THE LANCET.

SIR,—In a paper read before a joint meeting of the Society of Medical Officers of Health and the Royal Sanitary Institute, held at Blackburn in the spring of 1922, dealing with my experience of the Schick test and toxin-antitoxin immunisation, I contended that the question was primarily one which concerned the public health authorities. The leading article in THE LANCET of Jan. 19th, prompts me to urge this view once more. Sufficient work has been done by Park, Zingher, and others to show that the Schick test is a reliable indicator of susceptibility to diphtheria, and also that toxin-antitoxin immunisation confers protection which lasts for years, possibly for life; at any rate certainly for that age-period when the majority of children are Schick-positive.

Public health authorities, through their child welfare and school medical officers, come into daily contact with children at the most susceptible age-period, and also under conditions which favour accurate tests and careful observation. If, as the result of judicious propaganda and enlightenment of their controlling public bodies, medical officers of health were to make practical use of this recent discovery in preventive medicine, to them, in no small measure, would be due the credit of having greatly minimised and perhaps ultimately abolished a universal and dangerous disease.—I am, Sir, yours faithfully,

T. E. DICKINSON.

Bedford-square, W.C., Jan. 21st, 1924.

MALARIA CLINICS IN RUSSIA.

To the Editor of THE LANCET.

SIR,—The Malaria Clinic in Buzuluk was the first opened by the Quakers in the famine area, and is now the centre of a number of similar clinics scattered over a wide country district. In the last week of October, 1922, I reached Buzuluk, but had to wait a fortnight for the clinical laboratory outfit which I had bought in London. Dr. Melville Mackenzie, who was then the chief medical officer of the Friends' Mission, suggested [1] that in the meantime I should make examinations for malaria of the blood of a few families connected with the Mission. There had been a very severe epidemic of tropical malaria during the summer and the death-rate was very high. The news spread through Buzuluk that the Quakers were going to treat malaria, and within the first week the medical office was besieged with hundreds of would-be patients. We had a certain amount of quinine—a gift from the British Government—and it seemed impossible to refuse them, so the following rules were drawn up by Dr. Mackenzie:

1. Only those patients to be treated in whose blood malaria parasites could be demonstrated.

2. No quinine to be given to take at home, but patients to attend as required at the Mission dispensary and take their dose under supervision.

3. The patient to agree to take the full course of quinine.

Without these rules some patients would have sold quinine handed out to them, and many more would

[1] See M. D. Mackenzie: Malaria in South-East Russia, THE LANCET, Dec. 8th, 1923, p. 1225.

have shared it with friends, or have put half of it aside for the dreaded time when probably there will be no Quakers and consequently no quinine. The numbers have gone steadily up from an average of 50 new patients daily to 200 and more in Buzuluk alone. No certain figures are obtainable, but from general observations 80 per cent. may be taken as a low estimate of the number of the population affected by the disease. People come to the clinic from as far away as 50 miles, arriving behind horses, cows, or camels, their various equipages filling the street for a hundred yards. The quick results of quinine treatment astonish even those of us who have long been accustomed to malaria work in tropical countries. Patients seldom have an attack of malaria after commencing treatment.

It has never yet been possible to receive every patient who applies, as the number has to be restricted by the amount of quinine in hand for the month. We receive quinine now almost entirely from America in very large quantities, but even so every clinic (of which there are now several which have been opened one by one in various parts of the country) has an allowance much below what it could use. The patients are extremely grateful, especially those who have to work in the fields, as daily attacks of malaria prevent many from getting on with the ploughing in the spring, and this means starvation for their families in the following winter and in the aggregate a great setback to the slowly returning prosperity of the Ooyezd. If people could only see the street outside the clinic on any market day they would understand why it is hard to choose which patients to turn away. It is no uncommon thing to find an unconscious man on the pavement or road, no one taking much notice of him or attempting to move him to a safe place, for people are used to this by now and so many of them are sick themselves.

Those who are turned away from the clinic have absolutely nowhere else to go for help, and what we want to do is to make it possible to receive all who come. I appeal, therefore, to any who are interested to make gifts of quinine so that we need not turn away those who need our help.

I am, Sir, yours faithfully,

ETHEL M. CHRISTIE,
Supervisor of Malaria Clinic, Buzuluk; formerly Assistant Pathologist, Royal Westminster Ophthalmic Hospital.

Jan. 10th, 1924.

*** We understand that gifts of money or quinine will be gratefully received by the Friends' Council for International Service, Devonshire House, 136, Bishopsgate, London, E.C. 2.

PROF. WHARTON JONES AND THE LATE SIR JOHN TWEEDY.

To the Editor of THE LANCET.

SIR,—Apropos of the letter in your last issue from the Rev. P. G. Cawley, the following anecdote communicated to me by the late Sir John Tweedy may be of interest to your readers. Sir John Tweedy gave me the facts of the case for publication in my "Lives of the Fellows of the Royal College of Surgeons," and it seems only yesterday—it was in October, 1919—that he told his story with unusual vivacity, his painful breathing momentarily forgotten, and with something perhaps of a return to the spirit of his early journalistic days.

Sir John (then Mr.) Tweedy being present at a staff meeting of THE LANCET was asked whether he had got ready a biographical notice of Mr. Wharton Jones, as the latter had written to University College Hospital to say that he was unable to attend, and it was therefore inferred that he was ill. It was feared that at his age illness might indicate "the last phase." Mr. Tweedy at once called on Wharton Jones to inquire about the state of his health. It was during the week of the great blizzard of January, 1881, when the snow lay heavy in the streets of London for seven days and all traffic was at a standstill. Wharton Jones occupied a house, where he had given rooms to a poor couple, husband and wife, who looked after him in return for their lodging. To Mr. Tweedy's horror, when he entered his old teacher's room, he found him crouched beside a fireless grate, his shoulders hunched up under a mass of shawls and shabby wraps, the picture of destitution. He was gnawing a cold and uninviting piece of beef-steak and a crust of bread, the wretched meal being all, as the woman of the house informed the visitor, that she and her husband could spare from their own scanty food-supply. Wharton Jones, the distinguished man of science, the revered master of Huxley, was dying of starvation or at least of malnutrition. He had not a penny of money, he was ill, his food was such as his visitor saw. Mr. Tweedy took prompt measures and called on Dr. Sidney Ringer, to whom he said: "Do you know that Wharton Jones is dying of starvation?" At once a rescue party was formed. Mrs. Sidney Ringer, with much experience as a nurse and a kind heart, started off forthwith with soup, jelly, and other restoratives. Her husband wrote a cheque for £25. Armed with this, Mr. Tweedy stepped over to Mr. (afterwards Sir) John Erichsen and told the story. Greatly concerned, Erichsen wrote a handsome cheque. Mr. Tweedy paid other calls on leading medical and scientific men, friends, and colleagues of Wharton Jones, and, in a few hours, had collected £140. This sum was paid into the bank by Erichsen in sovereigns so that the beneficiary might not guess to whom he was indebted. His life was saved. About this time Huxley, on whom Mr. Tweedy had called, Erichsen, and another eminent man, Sir Joseph Fayrer, laid the case before Mr. Gladstone, then premier, who said that the Pensions List was made up, but that Wharton Jones should be in the next Civil List. Eventually he received a pension of £100 or more, to which was later added the Tancred Pension granted him at the instance of Sir William Jenner, then President of the Royal College of Physicians.

Wharton Jones never knew who his benefactors were or what Tweedy had done for him. In his retirement at Ventnor, where he was known as a quaint local figure, he managed to save some £600 before his death on Nov. 7th, 1891, ten years after the destitution episode. This money was, I have heard, left to a legal friend, to whose good offices Wharton Jones erroneously believed himself to owe his safety from starvation.—I am, Sir, yours faithfully,

VICTOR G. PLARR,
Librarian, R.C.S. Eng.

Jan. 19th, 1924.

*** In THE LANCET of July 16th, 1921, we referred briefly to the pathetic story which Mr. Plarr details. —ED. L.

GLASGOW ROYAL MEDICO-CHIRURGICAL SOCIETY.—On Friday, Jan. 11th, this Society met in the Glasgow Royal Maternity and Women's Hospital, with Dr. A. Maitland Ramsay, the President, in the chair. The meeting took the form of a clinical night and the following demonstrations were given by the members of the staff of the hospital. Dr. J. Norman Cruickshank demonstrated a number of specimens illustrating the birth hæmorrhages of the infant, and explained their mode of production. He gave the results of the analysis of 400 post-mortem examinations carried out in the research department of the hospital, and showed the incidence of tentorial tears and of the various grades and types of hæmorrhage met with. The frequency of still-birth associated with each type of lesion was also pointed out. Two other series of preparations were also shown—one illustrating developmental anomalies and diseases of the new-born, and the other illustrating some of the maternal lesions in the toxæmias of pregnancy. Dr. Douglas M. Lindsay demonstrated two new obstetrical instruments—(1) a "decapitating thimble" to facilitate the operation of decapitation, and (2) a new type of obstetric forceps. Dr. S. Cameron performed Cæsarean section on a case with marked pelvic contraction. The cases shown included the following:—Dr. A. N. McLellan: A case of exophthalmic goitre complicating pregnancy. Dr. R. A. Lennie: Two cases of cardiac valvular disease associated with pregnancy. Dr. John Hewitt: Cases of albuminuria in pregnancy. Dr. James H. Martin: A series of ante-natal cases. Dr. James Hendry: Two cases of rupture of the uterus, and one case of bronchitis complicating the puerperium. Dr. Donald McIntyre: A series of post-natal cases.

Obituary.

EDWARD EMRYS-ROBERTS, M.D. LIVERP.

WE have to record with regret the death on Jan. 15th of Prof. E. Emrys-Roberts, at Penarth, at the early age of 45. Prof. Emrys-Roberts held the chair of Pathology and Bacteriology in the National School of Medicine of the University of Wales, and was pathologist to the Cardiff Royal Infirmary. Born in 1878, he was the eldest son of Mr. E. S. Roberts, of Dawlish. He began his medical studies at Liverpool, and took the degrees of M.B., B.Ch. at the old Victoria University in 1902. During his student days he served as a dresser with the Welsh Hospital attached to the Field Force in the South African War, and obtained the medal with three clasps. On his return he worked as a research scholar for three years on gynæcological pathology in the University of Liverpool, and graduated M.B., B.Ch. Liverp. in 1904 and M.D. in 1908. After acting as sub-curator of the pathological museum in Liverpool, he was appointed demonstrator of pathology in the University of Bristol and pathologist to the Bristol General Hospital. He proceeded in 1910 from Bristol to Cardiff, on his election to the professorial post which he held till his death. During the war he served with the First Army from 1915–18 in command of the Welsh Mobile Pathological Laboratory in France.

An article dealing with status lymphaticus by Prof. Emrys-Roberts appeared in the *Journal of Pathology and Bacteriology* in 1914, and he was secretary of the committee of the Medical Research Council appointed to investigate this condition. He also wrote in 1920 in the *Journal of the Royal Army Medical Corps* on the use of horse serum by inoculation in the treatment of sepsis; and was recently interested in the study of anthracosis. He was responsible for organising at the Cardiff Royal Infirmary a department of pathology in preparation for the completion of the School of Medicine, a development which he anxiously looked forward to and just lived long enough to see accomplished; in him the young school has lost a keen supporter and an indefatigable teacher. The Cardiff Medical Society owed him much; he was its senior secretary and enthusiastic in his work for it. Apart from his professional researches, his chief interests lay in ethnology and archæology. He was local correspondent of the Ancient Monuments Board for Wales, and local secretary of the Cambrian Archæological Association.

Prof. Emrys-Roberts, on account of a dysenteric condition contracted while abroad, had for some time been in imperfect health; and last autumn he himself was the first to diagnose that he had developed a serious condition which was only confirmed, but could not be alleviated, by operative procedure. He leaves a widow and six children.

ARTHUR CHARLES ROPER, F.R.C.S. EDIN.

BY the death of Mr. A. C. Roper, consulting surgeon to the West of England Eye Infirmary, on Jan. 11th, in his sixty-sixth year, the medical profession has sustained a great loss. His keen many-sided interests, his fine public and professional work, his sound judgment, his tact and kindness of heart, had made him many friends and earned him a high place in public esteem. He was a son of Mr. Charles Harriot Roper, who was for a long period a leading Exeter surgeon. Arthur Charles Roper received his early education at the Old Mount Radford School, of which his grandfather was joint principal, and began his medical career at St. Bartholomew's Hospital, London, where he obtained the M.R.C.S. in 1880. The following year he took the degrees of L.R.C.P. Edin. and L.M., and returned to Exeter to take over the practice of his father, who died in the spring of 1881. Shortly afterwards Mr. Roper was elected a member of the staff of the West of England Eye Infirmary, and his long connexion with that institution—since 1881—is associated with his position as one of the leading ophthalmic surgeons of the West of England. He was a member of the Oxford Ophthalmological Congress, and president, in 1923, of the South-West of England Ophthalmological Society. But he was also deeply interested in general surgery, and had a wide consulting practice. In the British Medical Association he played an active part, and was president of the South-Western Branch. He always took the greatest interest in the Royal Devon and Exeter Hospital, to which he had been surgeon since 1896, and consulting surgeon since 1921, and he was at one time surgeon to the Exeter Lying-in Charity. He was oculist and consulting surgeon to the Cottage Hospitals of Exmouth and Sidmouth, ophthalmic surgeon to the West of England Blind Institute, consulting surgeon to the Western Counties Institution at Starcross, and also to the Exeter Dispensary. In 1922 he gave up private practice, but continued his work as consultant oculist and surgeon. Mr. Roper, among his medical writings, contributed several articles to THE LANCET. A paper on the Enucleation of the Eyeball with Intra-orbital Injection of Cocaine appeared in our columns in 1888, and in 1922 he published the result of 489 cases of cataract extraction (THE LANCET, 1922, i., 625; and 1907, ii., 1679).

As Mayor of Exeter (1920 to 1921) he took a leading part in organising an appeal to the citizens on behalf of their hospital, and was largely instrumental in securing for the institution a sum of nearly £6500. In recognition of this service one of the wards of the new children's bungalow was named after him "The Arthur Roper Ward." In 1919 he received from the King of the Belgians the Médaille du Roi Albert for his work in aiding generally and acting as honorary oculist for the Belgian refugees in Devon and Cornwall.

In the musical world he was equally public-spirited, and his fine baritone voice was welcomed at many a concert. He was for about 45 years a member of the cathedral voluntary choir, and he had long been joint secretary of the Western Counties Medical Association. Enthusiastic in all he took up, he was a well-known croquet player and an ardent golfer. He was also an excellent actor, and took a prominent part in the formation of the Exeter Dramatic Society.

Mr. Roper is survived by a widow, two sons, and two daughters. One son was killed in the war, having won the M.C. Another son, Dr. F. A. Roper, is now physician to the Royal Devon and Exeter Hospital.

SIR ARCHIBALD DOUGLAS REID, K.B.E., C.M.G., M.R.C.S. ENG.

Sir Archibald Reid, superintendent of the X ray department of St. Thomas's Hospital, died on Jan. 15th at Chur, Switzerland, in his fifty-third year. He was the only remaining son of Dr. Douglas A. Reid, late of Tenby, and was born in 1871. He received his medical education at King's College Hospital, and qualified as M.R.C.S., L.R.C.P. in 1901. From the beginning of his career he specialised in X ray work and in 1920 took the diploma of medical radiology and electrology at Cambridge. He contributed much to the study of his particular branch of medicine, and during the war from 1915 to 1919 rendered valuable service as President of the War Office X Ray Committee. In 1917 he was created C.M.G., and in 1919 he received the further honour of K.B.E. As a consulting radiologist he held appointments in many hospitals, among them the Queen Alexandra Military Hospital at Millbank and the Royal National Hospital for Consumption at Ventnor, and was radiographer to the Evelina and Paddington Green Hospitals for Children, and to the Royal Westminster Ophthalmic Hospital. In King's College Hospital he was medical officer in charge of the X ray department. In 1911–12 he was President of the Electro-Therapeutic Section of the Royal Society of Medicine, and in 1920–21

esident of Society of Radiologists. At the Seventnth International Congress of Medicine he held the st of joint secretary, and he was an hon. member the American Roentgen Ray Society. At the time his death he was charged with the radiological amination of the mummy of Tut-Ankh-Amen, cooperation with Dr. D. E. Derry, as we announced ently in our columns.

Sir Archibald Reid's scientific publications included icles in several standard text-books on "X Ray agnosis of Calculi," "Skiagraphy in Urinary rgery," and "The Treatment of Rodent Ulcer." s opening paper at the Bilingual Congress of Radioy and Physiotherapy on "The Abnormal Stomach" peared in the *Archives of Radiology and Electrology* 1922. He was editor of "Localisation and Extracn of Projectiles" (Ledoux-Lebard and Ombredanne). In personal tribute to his memory, a friend and league, S. M., sends us the following appreciation his character and work: "That Archibald Reid ould be struck down is difficult to realise, although se of us who knew him well have been conscious a long time that all was not well with him. Full of rgy, almost boy-like in his enthusiasms—a new ce of apparatus would send him off into great ilation—he was a man of wonderful personality. om the most absolute fooling he would turn at once matters of grave moment. He was a born ganiser, and his work in connexion with the new stitute of Radiology—alas! he has not lived to see it great meeting ground for all matters and persons sociated with the science he loved so well—was gantic. He was very fond of telephoning in the late ening, and conversations became so lengthy as to come a standing joke. One evening I went to his use and found him lying full length on an easy an with the telephone comfortably at his elbow. do not think Reid had an enemy. Many people til they knew him well were inclined to resent his idency to sharpen his wits on them, but there was t an ounce of malice in it. His place will not idily be filled, and we all feel the poorer for his loss"

IOMAS WILLIAM THURSFIELD, M.D. ABERD., F.R.C.P. LOND.

Dr. T. W. Thursfield, of Leamington, who died Jan. 14th, had reached his eighty-fifth year, and ough for some years retired from the active practice his profession, had retained in full degree unimired his mental and intellectual faculties. He was e son of a medical family, members of which have actised in the Valley of the Severn, in Worcesterire, and in Warwickshire for more than a century. s father, a doctor in practice at Kidderminster, ed when his son was just over 16. Thomas Thursld went to the University of Aberdeen, and passed e examinations for a medical degree some weeks fore his twenty-first birthday. After graduation studied his profession in London and in Paris, d acted as assistant in several practices, until he ok charge of a private patient whom he accomnied on a voyage to Australia. There his patient ed, and after some time spent in New South Wales returned to this country, and in 1866 settled in actice in Leamington. Then after some years of neral practice he passed the examination for the R.C.P. Lond., and entered upon a consulting actice, which in his best days included the neighurhood and the whole of South Warwickshire. became a Fellow of the College in 1890. In 1882 was elected to the staff of the Warneford Hospital Leamington, and after serving for many years ired from the active staff in 1911, and became nsulting physician. In the following years he voted himself to the interests of the institution, to ich he was so sincerely attached, serving on the mmittees of the governing body. In his prossional life he held many other appointments in amington and the neighbourhood.

His activities were, however, not limited to his ofessional work. He was always a strong politician, and took a keen interest in municipal affairs. In politics a Liberal, he became a Liberal Unionist, and remained Unionist, but with decided Liberal, even Radical, tendencies. In municipal business he served many years as town councillor, alderman, and in 1894–1897 as mayor of the borough. He was also a borough and a county magistrate. Perhaps his keenest interest, next to that of the hospital, was in the free library, to which he gave willing service nearly the whole of his life in Leamington.

He had outlived the greater part of his own generation both in and outside the profession, and the loss of his wife, to whom he had been happily married for more than 50 years, left him lonely in his last years, a loneliness often relieved by the welcome visits of friends. He died in sleep after an operation which was undertaken at his urgent request with the full knowledge that his strength, undermined by recent illness, was hardly sufficient to afford expectation of recovery. He left three sons, of whom one is in the medical profession.

CHARLES KIRK CLARKE, M.D., LL.D. TORONTO.

THE death of Dr. C. K. Clarke, since 1907 professor of psychiatry in the University of Toronto, at the age of 69, will be regretted by many of his co-workers in psychiatry in this country as well as in Canada, the more so as many of them had the opportunity of meeting him in London last summer. He was born at Elora, Ontario, and educated at the Elora High School and the University of Toronto, graduating M.B. Toronto in 1878 and M.D. in 1879. Even before qualification he showed a leaning towards psychiatry, becoming clinical assistant to the Toronto Lunatic Asylum in 1874. In 1879 he was made assistant physician to this institution, and after an interval of 15 years, during which period he gained experience as assistant medical superintendent at Hamilton and Rockwood Asylums, was appointed its medical superintendent. He held this position for six years, becoming medical superintendent of the Toronto General Hospital in 1911. While at Kingston Dr. Clarke acted as professor of mental diseases in the Queen's University, which made him an honorary LL.D. He was largely responsible for the establishment in connexion with Rockwood Asylum of a convalescent and nurses' home. Dr. Clarke was appointed Dean of the Medical Faculty of the University of Toronto in 1908, and held this post for some years. His publications are numerous not only on his special subject, but also on ornithology. For a time he was associate editor of the *American Journal of Insanity*. Dr. Clarke was known to be as much interested in the subject of mental hygiene as in that of insanity, and it caused no surprise that for the fourth Maudsley lecture,[1] delivered by him on May 24th, 1923, before the Medico-Psychological Society of Great Britain and Ireland, he took as title Mental Hygiene in Canada. One of the questions on which he felt strongly was that indiscriminate immigration to the colonies had its dangers, since the host of immigrants drifting from the old world always contains an undue proportion of defectives and mentally diseased persons. The training of psychiatrists was another subject which Dr. Clarke made specially his own. In Toronto there has been developed under his direction an optional course in psychology and psychiatry covering five years—the word "optional" signifying that less than half the candidates who apply to take this course are selected to enjoy its privileges. His desire adequately to educate the expert psychiatrist was associated with a strong impulse to promote the education of the public to demand such expert knowledge, and this work is being undertaken by the Canadian National Committee for Mental Hygiene over which Dr. Clarke presided. The loss sustained in his death is indeed severe, but it is certain that since the foundations of his work were well laid they will form the

[1] THE LANCET, 1923, i., 1123 and 1139.

basis of a widespread advance in efforts to eliminate mental disease from the community in the old and the new worlds.

JAMES TURTON, F.R.C.S. ENG.

Dr. Turton, who died on Jan. 11th at the age of 68, had been for many years a leading medical man in Brighton. He studied medicine with distinction at Charing Cross Hospital, qualifying L.S.A. in 1879 and became M.R.C.S.Eng. in the following year. Later he was elected a Fellow of the College. Dr. Turton went to Brighton in the early 'seventies as an apothecary to the late Dr. Richard Rugg, whose daughter he married. In 1886 he became identified with the Volunteer movement at Brighton. From acting surgeon he rose to the rank of surgeon-major, and retired in 1912 with the honorary rank of Colonel and the Volunteer decoration. He also served in the Army Medical Reserve, which he joined in May, 1888, holding the rank of surgeon-captain. In 1894 he raised the Sussex and Kent Volunteer Infantry Brigade Bearer Company, which was the first bearer company raised in the Volunteer Force, and he commanded that company until 1904, when he became Brigade Surgeon-Lieut.-Colonel of the Sussex and Kent Volunteer Infantry Brigade. At the outbreak of the Boer War his duties included the examination of the Sussex Militia; also the men who volunteered their services; and during the late war he was medical officer at the Royal Pavilion, Brighton, when that historic building was taken over as the Indian Hospital.

Dr. Turton took a keen interest in everything appertaining to the welfare of Brighton and for a period was a member of the town council. He was in demand as a vigorous speaker, and his knowledge of men and affairs secured for him what he had long coveted, a seat on the judicial bench.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Labour Government.

THE Government were defeated on Monday on the Labour Party's vote of "No Confidence" by 328 votes to 256. The Right Hon. J. RAMSAY MACDONALD having accepted the King's Commission to form an Administration, the House of Commons met on Tuesday, Jan. 22nd, and adjourned until Feb. 12th.

HOUSE OF COMMONS.

WEDNESDAY, JAN. 16TH.

Unqualified Persons Practising Medicine.

Mr. SPERO asked the Minister of Health if he was aware of the fact that, owing to advertisements issued by unskilled, untrained, and unqualified people practising medicine and surgery claiming special knowledge and ability to relieve and cure such dreaded diseases as cancer, &c., many lives had been seriously endangered and in some instances lost; and whether he was prepared to take immediate steps to prohibit them from advertising in any shape or form.—Sir W. JOYNSON-HICKS replied: My attention has been called to a recent case, where it appears that a patient may have been misled by an advertisement, but no information is available as to the extent of the evil to which the hon. Member refers, and I doubt whether legislation to prohibit unqualified medical practice would be regarded as uncontroversial.

THURSDAY, JAN. 17TH.

Mentally Afflicted Ex-Service Men.

Mr. GRAY asked the Minister of Pensions whether he was in a position to make a statement with regard to ex-Service men occupying the status of pauper lunatics; and whether he could inform the House the additional cost that would fall upon this country if pensions were granted to them as to other ex-Service men mentally afflicted.—Major TRYON replied: All men suffering from disabilities, whether mental or not, due to or remaining worsened by service are admitted to the full benefits of the Royal Warrant. But, as I have already stated, I am not in a position to recommend that an exception should be made in favour of any particular disability which would authorise my department to accept responsibility for men suffering from a condition not connected with their war service.

Mr. LANSBURY asked the Minister of Pensions how many ex-Service men suffering from mental disability have been discharged from maintenance by his department and transferred to the care of the Poor-law or other local authorities.—Major TRYON replied: The number of men whose mental condition could not be regarded as in any way due to or worsened by service, but who had benefited by the temporary concession in their favour which came to an end some 18 months ago, is 771.

Physically and Mentally Defective Children.

Mr. ROBERT MORRISON asked the President of the Board of Education how many physically and mentally defective children were on the roll of London special schools; and whether the figures showed an increase or decrease on the preceding year.—Mr. E. WOOD replied: The number of children on the rolls of London special schools for physically and mentally defective children for the week ending Dec. 21st 1923, was 12,243, showing a decrease of 328 on the figures for the similar week in 1922.

Pollution of the River Lee.

Mr. HERBERT MORRISON asked the Minister of Health whether he was aware that the pollution of the River Lee where it passed through the Metropolitan Borough of Hackney, was still exceedingly serious; that, despite prosecutions of local authorities alleged to have let crude sewage into the river, little or no improvement was taking place; and that the legal position in regard to the separate powers of the Middlesex County Council had created confusion so far as the county of Middlesex was concerned; whether, from the point of view of public amenity, public health, and the creation of much-needed employment, he would take steps to bring urgently before the Cabinet the question of putting in hand a main drainage system as satisfactory as that existing in the County of London, and in relation to that of London, in respect of the urban districts of Edmonton, Enfield, Leyton, Walthamstow, and other districts affected.—Sir W. JOYNSON-HICKS replied: I am aware of the conditions affecting the River Lee at Hackney but steps are now being taken which should result in a marked improvement. At Enfield works are in hand for which a loan of £53,000 has been sanctioned, and the Edmonton Urban District Council also have decided to carry out improvements at a cost of approximately £90,000. The local authorities of Walthamstow and Leyton are negotiating with the London County Council with a view to the reception of their sewage into the metropolitan system.

Convalescent Centre at Barry.

Mr. BARKER asked the Minister of Pensions if it was proposed to close the Prince of Wales Convalescent Centre at Barry; and, if so, would he have the question reconsidered on the ground that the trainees would lose the advantages of technical training or be transferred to English centres remote from their homes.—Major TRYON replied: It is anticipated that the requirements for accommodation at convalescent centres for treatment and training will not justify the retention for the whole of the current year of all of the four separate centres. A decision as to the centre or centres to be closed, and the date of closing must await further detailed examination of the applications received up to the date of the closing of the waiting list on the 31st ultimo. The hon. Members may rest assured that in the event of a centre being closed, suitable provision will be made for completing the treatment-training of the men, among whom transfers from one centre to another for various reasons are already not uncommon. The number of men who received treatment and training at Barry in 1923 was 569.

Specialist Treatment for Neurasthenia.

Mr. ROBERT RICHARDSON asked the Minister of Pensions whether any order had been issued prohibiting treatment by specialists in the case of men suffering from neurasthenia and assessed at 20 per cent. or under; and, if so, did the medical advisers of the Ministry consider that treatment was unnecessary in these cases.—Major TRYON replied: The answer is in the negative. The provision of treatment is undertaken by my department in all cases of neurasthenia in which a neurological medical officer of the Ministry considers it to be necessary.

Smoke Abatement.

Sir HARRY BRITTAIN asked the Minister of Health whether in view of the acknowledged evil effect upon the health of the community and the wastage of money caused by ever recurring fogs in our great cities, he was able to state that his department was doing all possible to expedite the passage into law of the Smoke Abatement Bill.—Sir W. JOYNSON-HICKS replied: It is proposed to reintroduce the Bill to which my hon. friend refers, and I hope it may be found possible to secure its passage into law during this session.

Incapacity and Death Certificates.

Mr. NAYLOR asked the Minister of Health whether his attention had been drawn to the objections raised by the issue of the new incapacity certificates (form Med. 40*b* and form Med. 40*c*), on the reverse side of which was a form of death certificate; and, if so, whether, seeing that these certificates were handled by the patients, he would take steps to have the form of death certificate issued separately.—Mr. W. A. JENKINS asked the Minister of Health if he was aware that the new issues of insurance incapacity certificate

ms Med. 40*b* and form Med. 40*c* contain on the reverse le a form of death certificate; and, in view of the pain, xiety, and distress which might be caused to the patient d his family, would he give instructions for these objec- nable forms to be immediately withdrawn.—Sir W. YNSON-HICKS replied: The form was prepared after nsultation with representatives of approved societies and surance practitioners, but I am referring it to the approved cieties Consultative Council for further consideration.

Dr. HADEN GUEST, in the course of the discussion on the abour Vote of Censure on the Government in the debate the address, said he had in his hand a curious piece of nk paper, which was a certificate from the National Health surance Authority. On one side there was a certificate at stated to so-and-so to whom it was addressed, "I certify at I have examined you and that you are unfit for work." low that there was a certificate stating that so-and-so "in a state of convalescence." On the reverse side of the me paper there was a certificate which ran as follows: Certificate of death of insured person." He urged that is was a failure to appreciate the point of view of the fortunate patient; a failure of contact with those con- tions of narrow living and poverty which were the lot of the ople to whom these certificates were given. In this rtificate the definite suggestion was conveyed to any tient that the end of this particular period of medical eatment was the certificate of death for the insured person.

Sir W. JOYNSON-HICKS: Perhaps the hon. gentleman will low me. There were two questions addressed to me this ternoon on this subject. It appears the proposal was ade by London medical men and had the approval of the cieties. As soon as I heard of it I suspended the issue of e certificate, and I have referred the matter to the nsultative Council of these societies.

Dr. GUEST said he was very glad to hear that this extremely fortunate document had been recalled.

FRIDAY, JAN. 18TH.

Calf-lymph.

Mr. ROBERT YOUNG asked the Minister of Health whether was aware that it had been stated that private medical actitioners experienced difficulty in obtaining supplies of ycerinated calf-lymph of the same guaranteed purity as at supplied to public vaccinators by the Ministry of Health; d whether, seeing that many persons preferred to be ccinated by their own medical advisers, he would take eps to secure the necessary powers to ensure that supplies such lymph would be procurable at a reasonable charge private medical practitioners.—Sir W. JOYNSON-HICKS plied: As regards the first part of the question, I am lvised that there is no difficulty in obtaining from reputable ms supplies of glycerinated calf-lymph of reliable quality. he action suggested in the second part of the question ould involve a large and costly extension of the present overnment supply, for which, as at present advised, I see need.

Unfit Houses.

Mr. VIANT asked the Minister of Health if he would troduce legislation amending the Public Health Act, 1875, ction 91, by extending the definition of nuisances to include mmon defects, as per the manual of the Ministry on unfit uses and unhealthy areas, volume 1, page 2 (general pairs), thus enabling local authorities to deal with property which grates, stoves, windows, window-frames, doors, walls, d ceilings were defective.—Sir W. JOYNSON-HICKS replied: he Local Authority had power under Section 28 of the ousing, Town Planning, &c., Act, 1919, as amended by ction 10 of the Housing, &c., Act., 1923, to deal with orking-class houses which were not in all respects reasonably for human habitation, and those powers should ordinarily sufficient.

Deaths from Small-pox.

Sir W. JOYNSON-HICKS informed Mr. LEACH that six eaths from small-pox were registered during the year 923, the outbreak being fortunately of a mild character. s regarded chicken-pox, figures are at present only available r the first three-quarters of the year; the number of eaths during that period was 41. During the first 11 onths of the year, eight deaths were attributed to vaccina- on, while five deaths attributed to other causes were nsidered to be associated with vaccination. The figures r December were not yet available.

Forms Med. 40b and 40c.

Mr. ALFRED T. DAVIES asked the Minister of Health hether his attention had been directed to the new issue f insurance incapacity certificates, forms Med. 40b and fed. 40c, on the reverse side of which is a death certificate; nd whether, in view of the general opinion of medical men nd the distinctly indelicate nature of the inclusion of such eath certificate, any action was to be taken.—Sir W. OYNSON-HICKS replied: I am arranging for the issue of ew certificates at an early date.

Somerset Small-pox Hospital.

Mr. FREDERICK GOULD asked the Minister of Health whether, in view of the fact that the Somerset County Council proposed to erect a small-pox hospital in a purely milk-producing parish where there was no public supply of water and no system of public sewerage, and having regard to the highly infectious nature of this disease and the strong opposition of the parishioners, he would refuse his consent to its erection.—Sir W. JOYNSON-HICKS replied: A public inquiry was held in November last by one of the medical officers of my department into the proposal of the Somerset County Council to appropriate certain land for the erection of a small-pox hospital, and after considering his report I sanctioned the appropriation of the land for this purpose. No further consent on my part will be required unless the county council apply for sanction to a loan to defray the cost of providing the hospital.

Disease Aggravated by War Service.

Mr. CLUSE asked the Minister of Pensions if he would state the number of men who during the past three years have had their diagnosis changed from attributed to service to aggravated by service; and how many of these had subsequently lost their pensions because the aggravation had passed away.—Major TRYON replied: During the past three years in the case of less than 2 per cent. of the men in receipt of pension, or about 18,000 men, has a disability been found on medical grounds to have been aggravated or worsened by service, instead of attributable to it. In 3500 cases, on the other hand, the diagnosis has been changed from aggravated to attributable. The records of the Ministry do not enable the last part of the question to be answered.

Amputation of Both Legs.

Major TRYON informed Mr. ROBERT MORRISON that men who had had both legs amputated at or above the middle of the thigh were entitled to the maximum constant attend- ance allowance of 20*s.* a week.

Small-pox or Chicken-pox?

Mr. BROAD asked the Minister of Health whether, in view of the fact that the disease notified as small-pox during 1923 was so mild as to be less fatal than chicken-pox, he was assured that it really was small-pox.—Sir W. JOYNSON-HICKS replied in the affirmative.

Fee to Midwives.

Capt. W. BENN asked the Minister of Health what security was provided for the payment to midwives of their fee out of maternity benefit drawn by insured persons under the Health Insurance Act.—Sir W. JOYNSON-HICKS replied: Beyond providing that the maternity benefit shall in every case belong to the mother, the Act does not specify any particular manner in which the money must be expended, and consequently there is no special provision with regard to the payment of a midwife's fee. The midwife has, however, the advantage of knowing that the woman will receive a fairly substantial sum by way of maternity benefit, and that she would, therefore, ordinarily be in a position to pay a reasonable fee in respect of the attendance she receives.

Medical News.

UNIVERSITY OF LONDON: FACULTY OF MEDICINE.—A course of four lectures on Cancer will be given in the Governors' Hall at St. Thomas's Hospital, S.E., by Dr. J. A. Murray, on Feb. 21st and 28th, and March 6th and 13th, at 5 P.M. The Provisional Syllabus is as follows: Lect. I.—Malignant new growths (carcinoma, sarcoma, endothelioma) of man and animals; separation from infective granulomata from benign tumours; microscopic anatomy of fully developed tumours; mode of spread and dissemination; unicentric and multicentric origin; multiple primary growths; frequency; age incidence; international statistics; increase of cancer; organ incidence; occupational cancer. Lect. II.—Experimental study of causation; virus sarcomata of fowls; spiroptera carcinoma; cysticercus sarcoma, X ray sarcoma, tar carcinoma, and sarcoma; relation to age incidence; chronic irritation; duration and intensity of stimulus; predisposition. Lect. III.—Regeneration, wound-healing and repair; irritative hypertrophy; equivocal microscopic appearances resembling new growths in early stages of development; stimulus to growth by injury; initiation of repair, activator substances; presence in rapidly growing tumours; acceleration of carcinogenesis by injury; resistance to a second production of primary cancer. Lect. IV.—Evidence of a cellular change in the malignant transformation; behaviour as new individual of primary growth; evidence from transplantation experiments; permanence of parenchyma characters; immunity to

transplanted growths: spontaneous cure; study of tumour metabolism; respiration, carbohydrate metabolism, protein metabolism, specific dietary deficiencies; rôle of diet in causation and treatment. At the first lecture the chair will be taken by Sir George Makins. The lectures, which will be illustrated by lantern slides, are addressed to advanced students of the University and to others interested in the subject. Admission is free without ticket.

University College.—A course of seven free public lectures on the Current Work of the Biometric and Eugenics Laboratories will be held on Wednesdays, at 6 P.M., from Feb. 13th to March 26th inclusive. On Feb. 13th Prof. Karl Pearson, F.R.S., will lecture on the Contributions of Sir Francis Galton to Photography: on the 20th Dr. M. Greenwood will discuss the Biometric Study of Cancer. Miss Ethel M. Elderton will speak on Inheritance in Finger-prints and the Possibility of their Use in Cases of disputed Paternity on the 27th, and Dr. Julia Bell on Colour Vision and Colour Blindness from the Historical Aspect on March 5th. Mr. Egon S. Pearson will discuss Birth Intervals as a Factor in the Size of the Family on the 12th, and Dr. Percy Stocks the Influence of Social Status and Physical Development on the Characters of the Blood on the 19th, while on the 26th Prof. Pearson will give the concluding lecture on the Contributions of Sir Francis Galton to Psychology. The lectures will be delivered in the theatre of the Biometric and Eugenics Laboratory at University College, Gower-street, London, W.C.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A special course of clinical lecture-demonstrations, including the use of the ophthalmoscope, will be given at the Central London Ophthalmic Hospital, Judd-street, from Jan. 28th to Feb. 22nd. Also a short course in dermatology, consisting of clinical demonstrations each afternoon, will take place at the Hospital for Diseases of the Skin, Blackfriars, from Jan. 28th to Feb. 10th, and special clinical lectures on the more important diseases of tropical countries will be given on Tuesdays and Thursdays at the London School of Tropical Medicine, Endsleigh-gardens, from Feb. 5th to Feb. 29th. The syllabus of the two weeks' special intensive course at the North-East London Post-Graduate College, Prince of Wales's General Hospital, Tottenham, is now available and can be obtained from the Secretary to the Fellowship of Medicine or from the Dean of the College. It includes demonstrations of clinical methods and cases and work in the general and special departments of the hospitals, and, in addition, a lecture each afternoon at 4.30 P.M. to which members of the North-East London Post-Graduate College and of the Fellowship of Medicine are invited. For those desiring to follow a course of study in the diseases of children, a special combined course has been arranged for the whole of February by the four following institutions—viz., Paddington Green Children's Hospital, Royal Waterloo Hospital for Children and Women, Victoria Hospital for Children, and the "Children's Clinic" at the Western General Dispensary. The programme consists of lectures and clinical demonstrations on medical and surgical diseases of children, including all the special departments and clinical laboratory demonstrations. Copies of the syllabus of any of the above courses with full particulars regarding fees, &c., can be obtained from the Secretary to the Fellowship of Medicine, at 1, Wimpole-street, London, W. 1.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—A dinner will be held in the Hall of the College, 9, Queen-street, Edinburgh, on Feb. 15th, at 7.15 for 7.30 P.M.

ROYAL SANITARY INSTITUTE.—A reception will be held at this institute, 90, Buckingham Palace-road, London, S.W., on Feb. 5th, at 5 P.M., to meet medical officers visiting this country, under the auspices of the Health Organisation of the League of Nations, to study public health administration.

EUGENICS EDUCATION SOCIETY.—A lecture on Eugenics in the United States will be delivered by Dr. Harry H. Laughlin, Director of the Carnegie Institute of Washington Eugenics Record Office, at the rooms of the Royal Society, Burlington House, Piccadilly, London, W., on Jan. 29th, at 8.30 P.M., Prof. E. W. MacBride, F.R.S., presiding. All interested in the subject are invited to attend.

SMALL-POX IN ENGLAND AND WALES.—The number of notifications of small-pox received by sanitary authorities in England and Wales during the week ended Jan. 12th was 80, distributed as follows: Derbyshire 40 (Bolsover 1, Chesterfield 11, Heanor 3, Ripley 1, Swadlincote 7, Blackwell R.D. 14, Hartshorn-and-Seals R.D. 1, Shardlow R.D. 2); Gloucestershire 17 (Gloucester 1, East Dean R.D. 16); Northumberland 1 (Ashington); Notts 19 (Hucknall 5, Kirkby-in-Ashfield 12, Basford R.D. 2); Yorks, West Riding 3 (Adwick-le-Street).

THE University of Edinburgh is to receive the sum of £48,000 as residue of the estate of the late Mr. Thomas McKie, advocate, Edinburgh, who died in 1909. Part of the bequest is to be devoted to scientific medical and surgical research.

BATH CLINICAL SOCIETY.—A meeting of this Society was held at the Royal United Hospital on Jan. 4th, Dr. W. P. Kennedy, the President, being in the chair. Dr. R. G. Gordon exhibited a case of subacromial bursitis, showing the typical signs described by Buckley; also a case of Charcot's knee-joint in a case of tabes with marked abnormal mobility. Mr. W. G. Mumford showed (1) a case of multiple staphylococcal osteomyelitis; (2) a case of swelling in both breasts due to rapidly growing carcinoma; and (3) a specimen of a pregnant uterus removed for a cervical fibroid. Dr. V. Coates showed a case which had been operated on four years previously when an inoperable cancer of the stomach was diagnosed. The history of miscarriages suggested that this was really a case of gastric syphilis. Dr. F. G. Thomson showed a case of aortic disease with fibrillation.

SOFIE A. NORDHOFF-JUNG CANCER RESEARCH PRIZE.—In the early part of last year (see THE LANCET, 1923, i., 481) we recorded the gift by Dr. Nordhoff-Jung, of Washington, Columbia, U.S.A., of an annual prize of $500, designed to encourage researches into the ætiology, prevention, and treatment of cancer. The Commission on the award was to consist of Profs. Borst, Doederlein, v. Romberg, and Sauerbruch, all of the University of Munich, and the prize was to be awarded for the first time at the end of 1923 in recognition of the most conspicuous work in the world literature bearing on cancer research, done at a time antecedent to the allotment of the award. The first recipient of the honour is Prof. Johannes Fibiger, professor of pathological anatomy at the University of Copenhagen. Prof. Fibiger has demonstrated, following repeated experimentation, that parasites play an important rôle in the formation of certain types of tumours in the proventriculi of rats. In the citation of the committee it is pointed out that it was Fibiger who first met with success in artificially inducing malignant tumours through external irritations, and he has thus thrown wide new avenues to future findings. Though the earlier results of Fibiger's work date back a number of years, he unremittingly laboured towards an interpretation of the significance of parasitic irritants in malignant tumour formation, likewise of mechanical and chemical irritants. Fibiger and his associates have contributed generously to the literature of cancer production through the feeding to rats of oats and the application of tar to their tissues.

THE LATE DR. O. M. DE JONG.—Dr. Oscar de Jong, whose death is reported from Liverpool, had only just been appointed medical superintendent of the new Seamen's Dispensary in Liverpool, which is intended to provide the facilities of an up-to-date "Lock Department," along with advice and out-patient treatment for seamen suffering from ailments of all kinds. Dr. de Jong qualified M.B., Ch.B. Manch. in 1914, taking his D.P.H. Manch. in 1915. At the time of his death he was but 31 years of age, but gave promise of a distinguished career in dermatology. At one time assistant M.O.H. for Liverpool and Salford and clinical assistant in the skin department of the Royal Infirmary, he was also medical officer in charge of the venereal diseases clinic at the Royal Southern Hospital.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear it if reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Jan. 28th.

ODONTOLOGY: at 8 P.M.

Casual Communication:

Mr. P. S. Campkin: A Lens Permeable by Ultra-Violet Ray—Used by Patient.

Paper:

Sir Frank Colyer: A Note on Caries of the Teeth of Old-World Monkeys (with lantern demonstration illustrating Irregularities of the Teeth of Old-World Monkeys).

Thursday, Jan. 31st.

BALNEOLOGY AND CLIMATOLOGY: at 5.30 P.M.

Papers:

Dr. W. J. Smith Jerome: On the Physiological Action of the Dry Inhalation of Sodium Chloride; an Italian Method of Treatment.

Dr. A. G. S. Mahomed: On Sea-water Injections.
Members of the Section will dine together at the Welbeck Hotel, Welbeck-street, at 7.30 P.M. Those desiring to be present are requested to inform Dr. C. F. Sonntag, 80a, Belsize Park-gardens, N.W. 3, not later than by the last post on Jan. 30th.

ROLOGY: at 8.30 P.M.
Clinical-pathological Evening:
Specimens: The following will be shown by:—
Mr. W. McAdam Eccles: Perirenal Tumour.
Sir John Thomson-Walker: Cyst of the Prostate.
Mr. S. G. MacDonald: Gall-stones removed from the Urinary Bladder.
Mr. A. Clifford Morson: Enormous Vesical Calculus.
Mr. W. Girling Ball: Retroperitoneal Tumour.
N.B.—Will those intending to take part please let Mr. Girling Ball know the type of case or specimen desired to be shown; also if a microscope is required.

Friday, Feb. 1st.

LARYNGOLOGY: at 5 P.M. (Cases at 4 P.M.)
Cases and Specimens:
Cases and specimens will be shown by Mr. Souttar, Mr. Peters, Mr. A. J. Wright, Mr. C. F. Beevor, Sir James Dundas-Grant, Dr. Jobson, Mr. Kelson, Sir StClair Thomson, and others.

ANÆSTHETICS: at 8.30 P.M.
Paper:
Dr. W. Howard Jones: The Use of Chloroform and the Mis-use of Ether.

Saturday, Feb. 2nd.

OTOLOGY: at 10 A.M. (Cases at 9.15 A.M.)
Paper:
Sir William Milligan: The Surgical Treatment of Suppurative and Certain Non-suppurative Affections of the Labyrinth (illustrated with lantern slides).
Cases:
Sir James Dundas-Grant: Two Cases of Radical Mastoid Operation treated Without Plastic.
Dr. T. B. Jobson: Case of Cerebral Abscess.
Other cases will be shown.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Jan. 30th.—4 P.M., Sir H. Gauvain: Heliotherapy and Open-air Treatment.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. 1.
MONDAY, Jan. 28th.—8.30 P.M., (1) Dr. G. Arbour Stephens: A Short Historical Note on Transfusion of Blood and Injection of Medicated Liquors as carried out in 1650–1700. (2) Dr. John Poynton, Mr. Twistington Higgins, and Dr. J. M. Erydone: A Paper on the Present Position of the Treatment of Pyloric Stenosis in Infancy.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Jan. 28th to FRIDAY, Feb. 1st.—CENTRAL LONDON OPHTHALMIC HOSPITAL. Clinical Lecture Demonstrations every afternoon. Mon. 2 P.M., Mr. Oliver; Tues., 2.30 P.M., Mr. Gibb; Wed., 2.30 P.M., Mr. Levy; Thurs., 2.30 P.M., Mr. Cunningham; Fri., 4.30 P.M., Mr. Williamson-Noble.—THE HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars. Clinical Instruction in the Out-patient Department every afternoon from 2.30 P.M. Tues. 5.30 P.M., Venereal Clinic. Wed., 4 P.M., Special Demonstration of Selected Cases.—WEST-END HOSPITAL FOR NERVOUS DISEASES, at 73, Welbeck-street, W. Mon., 2 P.M., Dr. Hildred Carlill: Hysteria and Other Common Neuroses. Tues., 5 P.M., Dr. Ridley Prentice: Paraplegia. Wed., 5 P.M., Mr. Lindsay Rea: Ocular Manifestations of Nervous Disease. Fri., 1.30 P.M., Sir James Dundas-Grant: Deafness in Nervous Disease.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Jan. 28th.—5 P.M., Prof. F. Cook: Observations on the "Toxæmias" of Pregnancy.
WEDNESDAY.—5 P.M., Prof. A. Fleming: Employment of Antiseptics in Treatment of Local and General Infections.
FRIDAY, Feb. 1st.—5 P.M., Prof. G. Jefferson: Injuries of the Cervical Spine.

UNIVERSITY COLLEGE, Gower-street, W.C.
FRIDAY, Feb. 1st.—5 P.M., Prof. J. Robertson: The Influence of Improved Town Planning and Housing in Public Health. (Second of three lectures.)

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Jan. 29th.—5 P.M., Dr. Graham Little: Epithelioma.
THURSDAY.—5 P.M., Dr. H. MacCormac: Ringworm.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Jan. 31st.—4 P.M., Mr. Tyrrell Gray: Abdominal Pain.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Jan. 31st.—5 P.M., Mr. Bourne: Puerperal Insanity.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Jan. 28th.—10 A.M., Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Simmonds: Surgical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Dept.
TUESDAY.—10.30 A.M., Medical Registrar: Medical Wards. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 3 P.M., Dr. Pernet: Skin Dept.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY, Feb. 1st.—12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, Jan. 30th.—4.30 P.M., Dr. A. Leitch: The Irritation Theory of Cancer.

LONDON SCHOOL OF MEDICINE FOR WOMEN, Hunter-street, W.C.
TUESDAY, Jan. 29th (and two following days).—5.30 P.M., Dr. Gibbon Fitzgibbon, Master of the Rotunda: The Treatment of Contracted Pelvis.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Jan. 28th.—(At the Children's Hospital.) Dr. Armstrong: Clinical Demonstration.
TUESDAY.—(At the Southern Hospital.) Mr. Armour: Certain Diseases and Deformities of the Foot.
WEDNESDAY.—(At the Northern Hospital.) Mr. Monsarrat: Surgical Treatment of Thyroid Disease.
FRIDAY, Feb. 1st.—(At the Royal Infirmary.) Dr. J. Owen: Demonstration of Children showing Conduct Change and other Sequelæ of Encephalitis.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, Jan. 29th.—4.15 P.M., Mr. A. H. Burgess: Some Questions in Connexion with Prostatectomy.

SALFORD ROYAL HOSPITAL LECTURES.
THURSDAY, Jan. 31st.—4.30 P.M., Dr. C. C. Heywood: Acute Rheumatism and Rheumatic Fever.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURE. (At Whitworth-street West Branch.)
FRIDAY, Feb. 1st.—4.30 P.M., Dr. F. H. Lacey: Visit to Obstetric Wards.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES.
TUESDAY, Jan. 29th.—(At the Royal Infirmary.) Mr. Pooley: Differential Diagnosis of Common Eye Conditions.
FRIDAY, Feb. 1st.—(At the Royal Hospital.) Mr. F. Wilson: Surgery of Infantile Paralysis.

MANCHESTER BABIES' HOSPITAL POST-GRADUATE LECTURES.
FRIDAY, Feb. 1st.—8 P.M., Dr. Hector C. Cameron: The Special Character of Disease in Infants.

Appointments.

ACLAND, T. D., M.D. Lond., F.R.C.P. Lond., M.R.C.S., has been appointed Honorary Consulting Physician to the Ministry of Pensions.
LAPPER, C., L.R.C.P. & S. I., Poor-law Medical Officer for Loughborough.
WHARTON, J., M.D. Camb., Hon. Ophthalmic Surgeon to the Manchester Royal Infirmary.

Vacancies.

For further information refer to the advertisement columns.

Bedford County Hospital.—Asst. H.S. £130.
Birkenhead and Wirral Childrens Hospital, Woodchurch-road.—H.S. £100.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £120.
Bournemouth, Holiday Home for Tuberculous Ex-Service Men.—Res. Med. Supt. £500.
Bradford City Municipal General Hospital, St. Luke's.—H.P.'s and H.S.'s. Each £200.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Registrar. 50 guineas.
City of London Hospital for Diseases of the Heart, Victoria Park, E.—Radiologist.
Discovery Expedition.—S. £600.
Dundee Royal Infirmary.—Hon. Asst. P. for Diseases of Skin.
Eday Parish, Orkney.—M.O. £340.
Elizabeth Garrett Anderson Hospital, Euston-road.—Asst. Clin. Pathologist. £100.
Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £250.

Gloucester, Gloucestershire Royal Infirmary and Eye Institution.—Sen. H.S. £175.
Hospital for Sick Children, Great Ormond-street, W.C.—Cas. O. Also Asst. Pathologist. Each £400.
Hull Royal Infirmary.—Sen. H.S. £200.
Lancashire County Mental Hospital, Winwick, Warrington.—A.M.O. £432.
Leeds Maternity Hospital.—Univ. Tutor in Obstetrics, &c. £300.
London Lock Hospitals, 283, Harrow-road, W., and 91, Dean-street, W.—Hon. Ophth. S.
London (Royal Free Hospital) School of Medicine for Women.—First Asst. in Obstet. and Gynæcol. Unit. £700.
Manchester Hospital for Consumption, &c.—Res. M.O. £300.
Middlesex Hospital, W.—Res. M.O.
North Marylebone School of Mothercraft, Maternity Clinic.—M.O. £1 11*s.* 6*d.* per session.
Nottingham General Hospital.—H.P. £200.
Plymouth, Devon and Cornwall Sanatorium for Consumptives, Didworthy, South Brent.—Res. Med. Supt. £550.
Queen Mary's Hospital for the East End, Stratford, E.—Hon. Asst. P.
Royal Earlswood Institution, Redhill, Surrey.—Jun. Asst. M.O. £250.
South London Hospital for Women, South Side, Clapham Common, S.W.—Asst. S.
Stockport Infirmary.—Physio-therapeutist.
Weir Hospital, Grove-road, Balham, S.W.—Asst. Res. M.O. £100.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg., Hon. Surg. Reg., and Hon. Obstet. Reg.
Westminster Hospital, Broad Sanctuary, S.W.—Asst. S.
West Riding Asylum, Wakefield.—Jun. Asst. M.O. £400.
Winsley Sanatorium, near Bath.—Sen. Res. M.O.
Wolverhampton and Staffordshire Hospital.—H.S. £150.
York City Mental Hospital, Fulford, York.—Locum Tenens. 7 guineas weekly.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Nant-garedig, Carmarthen; Forres, Moray; Pershore, Worcester; Greenlaw, Berwick.

The Secretary of State for the Home Department gives notice of a vacancy under the Workmen's Compensation Act for the district of the Wrexham County Court. Applications should reach the Private Secretary, Home Office, London, not later than Feb. 9th.

Births, Marriages, and Deaths.

BIRTHS.

HARDY.—On Jan. 13th, at Beaufort-road, Edgbaston, the wife of Dr. T. L. Hardy, of a son.
WARD.—On Jan. 15th, the wife of Gordon Ward, M.D., Sevenoaks, of a daughter.

MARRIAGES.

WILSON—AYRTON.—On Jan. 12th, at Chester, Graham Selby Wilson, M.D. Lond., M.R.C.P. Lond., D.P.H., to Mary Joyce Ayrton, M.A., M.B., Ch.B. Camb.

DEATHS.

EMRYS-ROBERTS.—On Jan. 15th, at Archer-road, Penarth, Edward Emrys-Roberts, M.D., Professor of Pathology, University of Wales, Cardiff, aged 45.
PHILIP.—On Jan. 15th, at Disraeli-road, Ealing, of heart failure, James Allan Philip, M.A., M.D., late of Boulogne-sur-Mer, aged 78.
REID.—On Jan. 15th, at Chur, Switzerland, Archibald Douglas Reid, K.B.E., C.M.G., aged 52. Beloved and only surviving son of Douglas A. Reid, M.D., J.P., 1, St. Augustine's Mansions, Westminster, S.W. 1, late of Tenby, S. Wales.
SIBBALD.—On Jan. 14th, at Crewkerne, Bernard Ian Graham Sibbald, M.B., aged 52 years.
THURSFIELD.—On Jan. 14th, Thomas William Thursfield, M.D., F.R.C.P., of Leamington, aged 84 years.
TURTON.—On Jan. 11th, James Turton, J.P., F.R.C.S., of 42, Norfolk-square, Brighton, aged 68 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

INSURANCE MEDICAL PRACTICE: A COMPARATIVE VIEW.

THE club doctor or Kassenarzt is passing through an anxious time in Germany. As our Berlin correspondent related last week, the radical changes in attendance on club members, forced on the doctors by the new Government, have caused a great upheaval. Medical opinion in Germany has pointed out as one man that the free-choice system of club practice is the only one likely to ensure careful attendance to club members, and popular opinion has supported this view. So far the doctors have been able to maintain their position of being unwilling to work under conditions which they regard as derogatory. Historically, it is interesting that, whereas in the drafting of the Insurance Acts free use was made of German precedents, Germany should now be turning with envious eyes to the present conditions of insurance medical service in this country.

In the *Medizinische Klinik* for Jan. 13th Dr. R. Güterbock makes a critical review of insurance against sickness and invalidity as it exists in this country. Its advantages he regards as too evident to require emphasis. The only drawback he finds in the provision of hospital treatment; this, he says, is closely related to the English plan of leaving their hospitals largely dependent on voluntary offerings, which results in the provision of a sufficient number of free beds in towns. But even in England, he adds, the arrangement is becoming intolerable and the medical profession is urgently demanding the provision of larger sums for hospitals and for the erection of maternities. Dr. Güterbock takes account of the relatively unfavourable position of the deposit contributors who, he believes, belong usually to the poorest of the poor—"tramps, drunkards, and skrimshankers." It is very hard on them that their sickness benefit should be limited by the sum which is paid into the fund, and for these, he says, new ways are being sought; for this category of humanity German insurance law makes no provision whatever. A further possible disadvantage Dr. Güterbock sees in the lack of death-money, to set against which there is the old-age pension, the unemployment benefit, and the better hospital provision. Such disadvantages as exist are entirely outweighed by the simplicity and economy produced by the pooling of sickness, invalidity, and unemployment benefits. In Germany no exact figures of the cost of administration have been made public; Dr. Güterbock quotes, but has been unable to check, the statement from an English source that in Germany administrative expenses amount to 70 per cent. He concludes his review by briefly referring to the dispute between the British Minister of Health and the doctors. The Minister, he said, based his proposed reduction in the capitation fee on the salary reduction of civil servants. The doctors' rejoinder would apply equally to German circumstances—viz., that the doctor draws no pension, that during holidays his income falls while his outgoings continue, that the running expenses of practice, of which the official knows nothing, continually rise. But the British Minister fully realised that insurance service must in any case be so paid as to ensure a sufficient supply of capable doctors. All parties in England—the Government, the societies, organised labour, public opinion—are clear that only by the voluntary efforts of a medical profession protected against material want can any system of State insurance be permanently maintained; that, in fact, by lowering the standard of living of the medical profession the insurance principle will collapse, and the general health of the people must suffer. This is Dr. Güterbock's final comment.

The position of the Kassenarzt has recently become so pitiable as to elicit some measure of public sympathy in Germany, as may be seen from a cartoon here reproduced from a recent issue of *Simplizissimus*. The legend runs:—

Left: Work so that you may pay regularly your club money.
Right: When you are ill, the miserably paid club doctor comes. . .

ne good feature of an otherwise painful situation is that ie quarrel with the clubs has united the medical profession Germany as it has never been united before.

COUNTY SCHEMES FOR THE PREVENTION OF TUBERCULOSIS:

THEIR ORGANISATION AND ADMINISTRATION.

At the Royal Institute of Public Health on Jan. 23rd r. G. Lissant Cox, central tuberculosis officer, Lancashire ounty Council, delivered a lecture on this subject, of which ie following is an abstract.

It must be remembered, said Dr. Cox, that all schemes nd measures dealing with tuberculosis should have pre-ention as the ultimate aim; it is more important that at tuberculosis dispensary patients be taught how to use aper handkerchiefs than that they should be supplied ith cod-liver oil and malt. Any thorough tuberculosis heme should be capable of dealing with: (1) pulmonary iberculosis in children and adults; (2) non-pulmonary iberculosis in children and adults; (3) tuberculosis in attle.

I do not propose to deal with tuberculosis in cattle, xcept to say that if public opinion would force on measures o reduce the 2 per cent. or thereabouts of cattle with tuber-ulosis of the *udder*, very many children would be saved om crippling disease, many from death, and much expendi-ure saved on treatment.

The Tuberculosis Officer and the County.

Given sufficient scope and material, the success of any cheme depends ultimately, of course, upon the man ppointed to work it. It is, I think, generally recognised hat counties or county boroughs large enough to be able o employ one or more whole-time tuberculosis officers how more efficient schemes and better results than places here only a part-time officer can be employed. There re two conceptions as to the main lines of a tuberculosis fficer's work. First, that he be a first-rate clinician, paid s such, and looked upon as a consultant by the doctors n general practice, but having administrative ability and public health outlook; and, secondly, that he be a part-ime tuberculosis specialist undertaking other public health ork (school medical duties, &c.).

The very great differences which exist in England between he size of different administrative units is a factor whose mportance is not infrequently forgotten, especially by ersons who elaborate theoretical schemes for the preven-ion and treatment of tuberculosis. I need only give nstances such as the administrative county of Lancaster, ontaining a population of 1¾ millions, and the counties of Iuntingdonshire with 55,000 of a population, and Rutland ith less than 20,000.

Dispensary Organisation.

The headquarters staff and intelligence department of he campaign against tuberculosis is at the present time ocated in the tuberculosis dispensary and works through he dispensary organisation. The dispensary organisation onsists of a tuberculosis officer, tuberculosis nurses or ealth visitors, the dispensary clerk or clerks, and, in addi-ion, a building. Its functions include: (1) Diagnosis of atients or contacts of patients, and determination as to orms of treatment; (2) supervision of home treatment, ncluding general hygienic precautions as to spread of nfection; (3) keeping of records and information of all kinds; (4) keeping in touch with the local care committee, nd, in county areas, with the local sanitary authorities.

All tuberculosis schemes consist of one or more such dispensary units. The size or number of these units will depend upon the size of the population of the county. The minimum number of population for a single whole-time tuberculosis specialist should be about 150,000. As a general rule, if the area contains less than this number, there is not enough tuberculosis work for one man, who in consequence must take on other work and cease to be a full-time tuberculosis officer. It must be remembered that a county area consists of a number of local sanitary areas, either rural districts, urban districts, or non-county boroughs, each of which has a separate sanitary administration—that is, each has a medical officer of health with a staff and a council to which he is responsible.

In Lancashire the population in the county area alone, excluding the county boroughs, is 1¾ millions. The dispensary units are five in number, and consist of an average population of 345,000, each area being under the charge of a consultant tuberculosis officer having a chief dispensary with an office, clerical staff, X ray room, laboratory, and throughout the unit two, three, or more branch dispensaries; and to assist the consultant tuberculosis officer there are in these large dispensary units one or more assistant tuberculosis officers, and in each unit six or eight tuberculosis nurses. This arrangement has up to the present worked very well. In spite of many of the local sanitary areas having populations varying from 20,000 to 45,000, it has been found quite easy to make arrangements with local medical officers of health whereby all visiting is done by county nurses, the initial reports on the homes being accepted by the local medical officers of health, so that no overlapping whatever occurs. This is a very important point in county administration.

If the tuberculosis officer is really to be a specialist, treated as a consultant by the general practitioners, he must have, in addition to natural ability, all modern aids to diagnosis, and no scheme is complete which does not include the provision of an X ray plant. This, to be of greatest use, must be in the chief dispensary and used by the consultant tuberculosis officer himself, as is done throughout Lancashire.

No tuberculosis scheme is complete without care work and care committees. The tuberculosis officer must act as medical adviser to prevent any overlapping as regards assistance to the patient from other agencies. Not the least important result of having care committees composed of representatives of local authorities, trade-unions, guilds of help, and others is the knowledge gained by these members of the real nature, extent, and aims of the county or borough work dealing with the prevention of tuberculosis. The five dispensary units in Lancashire have at present 15 care committees, and the amount or value of goods distributed last year was £1500.

Institutional Accommodation.

The provision of institutional treatment which is necessary in every complete and efficient tuberculosis scheme will include (*a*) sanatoriums for children and adults (pulmonary tuberculosis) for early and intermediate cases and observation cases; (*b*) pulmonary hospitals for the isolation and treatment of chronic or advanced cases, or cases acutely ill, as near to their homes as possible; (*c*) arrangements with general hospitals and infirmaries and convalescent homes for surgical cases, children and adults; (*d*) special hospitals for children suffering from non-pulmonary tuberculosis; (*e*) tuberculosis settlement. It will be easily seen from this list of different kinds of institutional treatment that the larger the area, the better chance there will be of financial arrangements to carry them out. With regard to children, provided that nothing is done as regards tuberculous cattle, it would appear that about one bed per 19,000 of the total population is required for pulmonary cases, and one bed per 12,000 of the total population for non-pulmonary cases.

Sanatorium Treatment.

Given reasonably early cases for treatment, and an institution with a whole-time and capable man at its head, sanatorium treatment still holds the field. In Lancashire, of 3950 early and intermediate cases of whom 2270 went to a sanatorium and 1680 did not, the deaths at the end of 1922 among those who entered upon treatment during the five years 1914–18 were as follows: (*a*) Of patients with "negative" or "absent" sputum at the end of 1922, 16 per cent. of sanatorium cases and 42·6 per cent. of non-sanatorium cases had died: (*b*) of patients with "positive" sputum at the end of 1922, 66·2 per cent. of sanatorium cases and 84·8 per cent. of non-sanatorium cases had died. As regards prolongation of life, these results favour sanatorium treatment. Even if they were less favourable, it must never be forgotten that from the more important side of the prevention of the disease a stay in a sanatorium has, in the main, a definite educational result on the patient, his family, and his friends.

Cost of a Tuberculosis Scheme.

All tuberculosis schemes are financed partly from the rates and partly by grants of 50 per cent. of the net approved expenditure by the Ministry of Health, which also makes certain other payments for specific purposes, whilst the Ministry of Pensions contributes for the present towards the cost of treatment of tuberculosis pensioners. In Lancashire a penny in the pound on the rateable value brings in £36,000. Our scheme costs about one penny halfpenny (1½*d.*) as far as the rates are concerned, so that the total gross expenditure is about fourpence in the pound on the rateable value—or to put it another way, about £150,000 per annum for a population of 1¾ millions.

THE TRAINING OF AMERICAN NAVAL HOSPITAL CORPS.

THE ranks of the officers of the Medical Corps are acting assistant surgeon, assistant surgeon, and assistant dental surgeon, who all "have the rank of lieutenant (junior grade)"; passed assistant surgeon, passed assistant dental

surgeon, lieutenant; surgeon or dental surgeon, lieutenant commander; medical inspector, commander; and medical director, captain or rear-admiral. Above all these is the "Chief of the Bureau of Medicine and Surgery, with the rank of rear-admiral, title of Surgeon-General, and pay and allowances of major-general in the army." In the Nurse Corps are nurses, chief nurses, and superintendents. The "Hospital Corpsman" begins as a hospital apprentice, 2nd class (probably ordinary seaman), who does not appear to go to sea until he is advanced to 1st class; in time he becomes a petty officer with the title of pharmacist's mate, 3rd, 2nd, or 1st class; later he may be promoted chief pharmacist's mate, and then to warrant rank as pharmacist, and after six years more to chief pharmacist.

These men are all to be trained by means of a recently published handbook [1] which explains the navy to them, telling them how it is organised by departments, and lets the intelligent and curious recruit understand what is happening around him and why; besides it sketches for him the history of the Hospital Corps, and gives him a list of all the officers who have presided over the medical department, from William Paul Crillon Barton in 1842, to Edward Rhodes Stitt to-day; it tells him where the money comes from to keep the naval hospitals going, and what establishments there will be to receive him if, by ill luck, he is invalided out of the Service—all very interesting. Primarily this book is for the education of the recruit, but the needs of the petty officer, away by himself with no medical officer to rely on, in a small craft or at a shore station, has been ever in the minds of the compilers, and thus are explained some surprising directions. For example, if appendicitis is suspected the "corpsman" is advised to "make a white count if possible," and the treatment of Vincent's angina with Fowler's solution or chromic acid, as recommended, would appear an absurd and risky suggestion to be put before any chance orderly. There are the usual sections on anatomy (the picture of the skeleton is credited to the manual of the Royal Naval Sick Berth Staff, and the bones of the carpus are given in both the ordinary and the Berne nomenclature); physiology, first aid, including dental first aid and temporary stoppings, bacteriology, blood and urine examinations, diseases, including human parasites, with very detailed studies of the exanthemata, field sanitation, marches, X rays, drug addiction, massage and physiotherapy, chemical warfare, statistics, death, and embalming. There is a section on nursing by members of the nurse corps, with admirable detail for making beds. Chief pharmacists provide chapters on chemistry, pharmacy, materia medica, clerical work (with most useful lists of forms required on occasion, as when an officer wants leave or a deserter returns on board), administration of naval hospitals, foods, and dietaries—all most excellent.

The section on foods is particularly striking with its numerous tables to assist the hospital commissary (quartermaster, as we might say, or steward), a chief pharmacist, to construct from day to day and a week ahead, the diets, which are ordered to be varied and pleasant to eye and palate, and to give to each man 3563 calories per day. The lists of the 225 possible rations from which to choose are complete and detailed, and include, for example, "Angel cake; one piece, $1\frac{1}{4}'' \times 2'' \times 2\frac{1}{2}''$; 1·3 oz.; 100 calories. Pineapple, canned, sliced; one slice and three tablespoonfuls juice; 2·3 oz.; 100 calories. Lamb chops, braised, two chops; meat portion, $2'' \times 2'' \times \frac{1}{2}''$; 200 calories." It is always held in the merchant service that American sailors are very well fed; it seems that their bluejackets do pretty well too. There should have been greater care in revision; nerve fibrils do not "enervate" muscles (p. 65); "straight jacket" (p. 137), and "Colle's" fracture (pp. 81, 82, and in the index) are further examples. But in spite of small blemishes it is a wonderfully good book, and the various articles reflect credit on their authors. The "corpsmen" for whom it was thought expedient to have this book written should become valuable men; certainly the articles contributed by their chief warrant officers do great credit to the education they have been given during their service in the Hospital Corps of the United States Navy.

[1] Hospital Corps Handbook; United States Navy. 1923. Published by the Bureau of Medicine and Surgery. Washington Government Printing Office. 1923. Pp. 717. $1 (5/).

THE BRIGHTON INTERCEPTING SEWER.

WHEN the Brighton intercepting sewer was constructed—the work was begun in January, 1871, and completed in June, 1874—the population of the district served by it (the towns of Brighton and Hove) was, in round figures, 100,000. The population of the district is now over 190,000, and the time has come when attention must be given to the sewer, and the corporation is now seeking a provisional order that it may have power to cope with the demands that are being made upon the sewer to-day. By the present plan, as originally designed and constructed by Mr. (afterwards Sir) John Hawkshaw, the outfall into the sea at Portobello, some miles east of Brighton, is completely tide-locked for six and a half hours during each 24 hours, and more or less tide-locked for 12 hours per day. This has resulted in the sewer tank being charged unduly and the storage for storm water reduced. It is now proposed to reconstruct the outfall end of the sewer, and put down a new outfall from the point where the original sewer ended, and to have four 48 in. discharge pipes instead of three, and to carry the outfall 100 yards further out to sea. It is also proposed to fix three pumps, each with a capacity of 900 cubic feet per minute, two to be always working and the third as a standby, thus providing for a continual discharge for 24 hours per day, instead of the present limited discharge, and providing for an even flow of sewage as against the present storage for some hours. At the Ministry of Health inquiry held on Jan. 15th tribute was paid to the work of Sir John Hawkshaw in constructing the sewer, the cost of which was £100,000, the last repayment of the loans falling due during next year. This repayment has been a long and expensive process, but it has been warranted by the town's clean bill of health; so also doubtless will be the expenditure of £120,000 which is now being sought to provide not only for the needs of the moment, but for a population of 300,000.

THE PANEL SERVICE.

To the Editor of THE LANCET.

SIR,—Apropos of the recent case against two Lancashire doctors who were fined £1000 between them for breach of rules, would it not be reasonable for the panel practitioners to know exactly what are the powers of the Minister of Health (from whose decision there is no appeal) as regards the infliction and extreme range of penalties? The patients are informed on their cards (which they seldom even read) of the maximum penalties which can be inflicted on them—one never reads in the daily press of a patient being punished. Why not inform the practitioners? We have read of the £1000 fine; what is to prevent us reading of a £10,000 fine, imprisonment, or such other punishment? What would happen if a panel practitioner, whose panel was worth £200 per annum, were fined £1000 and he promptly gave three months' notice and resigned? Could any legal proceedings be taken against him?

I am, Sir, yours faithfully,

Jan. 12th, 1924. "PANEL DOCTOR."

SPUTUM TREATMENT OF WHOOPING-COUGH.

Prof. R. Kraus,[1] of Vienna, who was formerly in charge of the Serum Institute at Butantan, Sao Paulo, describes his method of treatment of whooping-cough, which has been employed in more than a thousand cases in hospital and private practice in the Argentine, Uruguay, and Brazil. The method consists in the subcutaneous injection of "antitossin," which is a preparation of the sputum of whooping-cough patients obtained during the first few days of the paroxysmal stage. The sputum is not employed until it has been found to be free from tubercle bacilli and other organisms by aerobic and anaerobic tests and by animal inoculation. The results of treatment were that the injections were followed by disappearance of vomiting, diminution in the number of the attacks, and a change in their character, the cough first becoming catarrhal and then ceasing altogether. Early treatment gives the best results. No bad effects were observed apart from transient local tenderness and infiltration and a rise of temperature which fell to normal in 24 hours. The dosage ranged from 1–5 c.cm., but as a general rule it was best to begin with 2 c.cm. and to repeat the injections every two or three days. An improvement was often seen after one or two injections, while in other cases three or four injections had to be given before any change was noticed, and some did not react at all. In the last group of cases successful results were obtained by inoculation of the patient's own sputum. The nature of the active agent in the preparation has not yet been determined, but the treatment is probably a form of protein therapy combined with some specific agent, as treatment of pertussis with the sputum of healthy persons or asthmatics had no effect.

[1] Wiener medizinische Wochenschrift, Nov. 24th. 1923.

T. N. H.—We have never heard of poisoning by CO initiating permanent and serious blood changes. It is occasionally followed by pneumonia, presumably broncho-pneumonia, just as it sometimes leads to multiple cerebral hæmorrhages. Harmful after-effects are certainly rare. Practically speaking, carbon monoxide is poisonous only because it combines with hæmoglobin, the shortage in oxygen-supply when not excessive being completely recoverable.

Present Position OF THE TREATMENT OF HYPERTROPHIC PYLORIC STENOSIS.[1]

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WE feel that there may be some danger that the ject of pyloric stenosis in infancy may seem thread- re, for much has been written upon it of late. In te of this, however, there apparently still remains certainty and difference of opinion upon certain dinal points which are of interest to physicians, geons, and pathologists, and we think that on this ount this would be a subject in harmony with that hly prized feature of this society, its general broad tlook upon medicine. We have ourselves arrived a definite conclusion upon the treatment of the ease, and wish to place our views before the society, ough in no arrogant spirit and with no claim to ginality. This conclusion we are prepared to dify if further study throws clearer light on the use of pyloric stenosis, but in the present phase of r knowledge we believe it to offer the best results. can be expressed in one sentence. *When once the agnosis has been made, operate at the earliest oppor- nity.* This is a definite statement, and the object of r communication is to put forward our reasons based on the exact details of our procedure and our results. Although the physician in these cases has to work nd in hand with the surgeon, the essential step in e successful result is the surgical procedure. At the tset one of us (F. J. P.) would like to put his own titudes to the treatment of pyloric stenosis over a riod of 20 years. Brought up, when once he learned recognise this condition, to treat it on medical lines, soon became convinced that for some cases this was peless. When he came in charge of wards he had ached the stage of seeing the necessity for ascer- ning which cases required operation, and then opted the attitude of giving a trial to medical treat- nt in all clear cases before approaching the surgeon. w when the diagnosis is made he at once advises operation—a position largely due to the debt which ysicians owe to such pioneers as Cautley and Clinton nt, Still, Burghard and Rammstedt. This attitude idently demands the necessity for making a sure agnosis, and leads to a cardinal point.

The classical symptoms of pyloric stenosis are, as we ow, projectile vomiting, visible peristalsis, tumour, d constipation. Active visible peristalsis is valuable, t for us the tumour is of the first importance. We cognise there is a decided difference of opinion upon e frequency of its detection and therefore upon its agnostic value. Nevertheless, our conviction is that we do not lay the greatest stress upon the tumour, shall find in the future many cases operated upon at are not really suffering from pyloric stenosis. ne of us (F. J. P.) inquired one day of a "nutritional ecialist" what criterion he took as a guide in spected cases, and was told loss of weight, but with is he did not agree.

[1] A paper read before the Medical Society of London, n. 28th, 1924.

EXAMINATION FOR THE TUMOUR.

Our experience has been that so far we have failed to find the tumour in only one case, though we have had difficulties with a few. In that single case our house physician had felt the tumour on one occasion. We have had no case in which death has occurred and an undetected tumour been discovered, and no case in which, when a tumour was felt, it was found non-existent at the operation. Having spoken so strongly upon this point we feel bound to give in detail our method of examination.

To relax our own muscles we sit beside the cot on the left side of the infant. The nurse gives a feed of milk or glucose water, and the left hand thoroughly warmed (a most necessary precaution) is laid flat over the epigastrium and kept motionless until it becomes a part of the abdominal wall. The edge of the liver, which is always palpable, is defined by the upper border of the index finger, and then the pylorus traced with the pads of the fingers used with the lightest possible pressure. The difficult tumours are those lying high up under the edge of the liver, but they can usually be detected on inspiration by their harder consistence. Another difficult one is the tumour that relaxes quickly. Some feel like the tip of the nose, some run transversely into the stomach wall, and some lie low down further to the right than usual toward the renal region. When we are sure that we feel the tumour, we only wait for the child to recover from any collapse due to the journey to the hospital before commencing the procedures for operation. We do not, as a rule, give bismuth meals, because our experience has been that they may do harm to an infant who has no reserve power, and they do not in ordinary cases tell us more than we can discover by clinical examination.

It may be asked, Do you never meet with a case in which you are not sure that there is a tumour, and yet from other symptoms you believe it to be a case of stenosis? Our answer is that, so far, in our series we have met with some doubtful cases, but with the one exception already mentioned, when we have not felt a tumour there has not been an operation, and these cases have either recovered or, if they have died, have not been cases of pyloric stenosis. Possibly we have been unusually fortunate, and one of us has met with two cases (not in our joint series) in which there was no tumour felt, but in these the remarkable peristalsis in association with the other symptoms led to a right decision. The great hindrance to a successful result has been, in our experience, the *duration* of the symptoms, and we shall later support this statement in an analysis of our statistics.

A strong infant with a long history of starvation is more likely to succumb than a weakly one with a recent history. One group to which further allusion will be made is that in which in the chronic disease there supervenes an acute exacerbation of vomiting with prostration and even fever. In such cases we at once press on operation. In practical terms we consider no case too ill for operation, for it is our experience that those that seem the most unfavourable may make easy recoveries, while the more promising ones may prove to be the most anxious. We look upon it, however, as essential to have a most careful plan of procedure, and shall give this in detail, not because we believe it to be infallible or beyond improvement, but because it has been very successful, was gradually evolved by sheer experience, and may be helpful to any who have not had the same opportunities. It has been evolved from the difficulties we have encountered and which we now enumerate.

DIFFICULTIES.

(1) Extreme illness and shock; (2) accidents during operation; (3) neglect of precautions in after care—viz., to avoid chill, to guard against high fever, and shock; (4) enteritis; (5) marasmus, in cases with a long history. Lastly, the physician is not anxious himself to perish from "case stenosis" as the result of the inroads of surgeons upon his territory; and if all the elaborate details concerned with the operation

were undertaken, success might, it was thought, follow without any surgical help. This was tried on a breast- and hand-fed infant respectively. In each case it was found that when the diet was raised above the starvation level the symptoms recurred, and operation was called for. One baby survived, the other died unable to endure the second period of partial starvation involved. These two cases were not considered to be fair to the surgeons, and they are not included in the series; but apart from them there has been no mutilation of our statistics.

In discussing the operative procedure adopted in these cases, and in presenting our results, we desire to make full acknowledgment of our indebtedness to those other surgeons, especially Rammstedt and Burghard, who have helped to improve the technique and have added to the literature of this subject in recent years. All our cases have been operated on by the "Rammstedt" method of transperitoneal section of the pyloric sphincter. We are satisfied that this method offers the quickest and safest means of relieving the stenosis. We will now describe the operation in detail:—

PRE-OPERATIVE TREATMENT.

(*a*) *Gastric Lavage.*—It is most important to have the stomach as empty and as clean as possible at the time of operation. A distended stomach makes for operative difficulties, while the passage of stagnant stomach contents into the intestine, immediately the pyloric stricture is relieved, is most undesirable. A short course of gastric lavage is therefore an essential preliminary, especially in long-standing cases with very dirty stomach contents. The final wash out is done one hour before operation.

(*b*) *To Combat Shock.*—Subcutaneous infusions of saline with glucose (2 per cent.) are administered usually twice, (1) 12 hours, (2) two hours before operation, 1½ oz. being run into each axilla. The baby's limbs are bandaged in cotton-wool, and the trunk warmly wrapped. The operating room is specially heated (75° F.).

(*c*) The last feed is given four hours before the operation.

(*d*) No preliminary hypodermic injection is used.

ANÆSTHETIC.

Ether and chloroform are contra-indicated by the grave danger of acidosis in these starved infants. We now use gas and oxygen in all cases. With this we have frequently combined local infiltration of the abdominal wall (skin and rectus sheath) with novocaine and adrenalin (novocaine 2 per cent., adrenalin sol. 1 in 1000, 5 minims to 1 oz.) with the object of diminishing shock and rendering the closure of the peritoneum more easy. Five of the worst cases in the total series were successfully operated upon under the local infiltration alone. We believe it to be a valuable addition to gas and oxygen in collapsed infants.

Position.—The baby is laid on a well-protected hot-water bottle, so as to throw the epigastrium into prominence.

OPERATION.

The abdomen is opened above the umbilicus to the right of the middle line by incising the rectus sheath and reflecting the muscle outwards. The stomach is picked up from beneath the liver edge and the pylorus delivered. Escape of intestine is prevented by a narrow "pack" tucked into the lower angle of the wound, and as little of the stomach as is necessary is brought out of the abdominal cavity. We employ the following method in dividing the sphincter: The operator fixes the pylorus with his left thumb and forefinger, while the assistant gently grasps the stomach; the "avascular" line on the anterior surface of the pylorus, close to its upper border, is identified. Occasionally this line may be invaded by a vascular twig, and we always attempt to circumvent such a little vessel if met with. With a clean scalpel the incision in the pylorus is begun, dividing the peritoneum and just entering the muscle layer. The muscle section is completed by using a pair of closed scissors as a blunt knife. This instrument divides the muscle quite easily and cleanly, and cannot injure the mucous membrane, as the latter bulges into the gap. The section must, of course, completely divide the pylorus, and special attention is always given to both ends of the incision with the object of ensuring this. Having completed the section, the cut edges of the sphincter are undermined, and the gap widened so as to ensure that the mucous membrane will bulge and herniate well up into the gap.

The pylorus is now carefully inspected for any bleeding-point. Occasionally a small vessel may ooze in the subperitoneal or in the submucous coat. Usually a pinch with forceps suffices to stop this. If necessary it may be underrun with a fine needle and catgut, or a muscle graft taken from the rectus abdominis may be applied. In our experience oozing of this type is rare. We believe that blunt section of the pylorus and thorough undermining by the method described are most important details in minimising the possibilities of hæmorrhage. In a personal experience to date of 65 cases, one of us (T. T. H.) has very rarely been delayed by a bleeding-point at the time of operation, and there has been no fatality from hæmorrhage in his practice. The pylorus having been returned to the abdominal cavity, the abdomen is closed in layers with fine catgut.

The peritoneal layer is sometimes troublesome, especially if the child is not taking the anæsthetic well. The omentum, aptly described by Mr. F. F. Burghard as "seaweed," floats up into the wound, and may make this the only really difficult step of the operation. The incision is always closed from below upwards, as by this means full use is made of the liver as a retractor in putting in the final stitches. The skin incision is closed by a single subcutaneous stitch of silk-worm gut. The wound is sealed with Whitehead's varnish and a small dressing and bandage are applied. The infant is rapidly enveloped in a warm blanket and carried back to bed. The operation lasts about ten minutes in the average case. Speed is certainly valuable, but in the words of Sir Berkeley Moynihan it should be the "daughter of experience and not the parent of disaster." It should never replace gentleness and delicacy of handling, which are first essentials.

POST-OPERATIVE TREATMENT.

The immediate post-operative concern is to keep the infant warm. If the condition is poor the lips are rubbed with brandy, and oxygen is administered occasionally. The temperature is recorded hourly (Fig. 1), and if it rises above 102° F. an ice-bag is put on the baby's head. This controls the development of post-operative hyperpyrexia, which is an occasional complication. Further subcutaneous saline is administered if necessary, but must be used with discretion for fear of "waterlogging" the lungs. In the case of hospital patients, we advocate early discharge to their homes.

Feeding.—We append our exact methods of post-operative feeding (*a*) in a breast-fed infant, and (*b*) in a bottle-fed infant.

Feeding of Pyloric Stenosis After Operation.

(A) *Breast-feeding.*

Operation 10.30 A.M., return to ward 11 A.M., milk drawn from mother four hours after.

First day: 3 P.M. to 8 P.M., ℥i. hourly; 9 P.M. and 10 P.M. ℥ii; 11 P.M. and 12 P.M., ℥iii.

Second day: 1 A.M. and 2 A.M., ℥iii.; 3 A.M. and 5 A.M., ℥iv.; 7 A.M. and 9 A.M., ℥vi.; 11 A.M., 1 P.M., and 3 P.M., ℥i. (to breast for three minutes, time varies); 5 P.M. ℥iss. (to breast for five to seven minutes); 7.30 P.M., ℥iss. Continue 2½-hourly for 12 hours.

Third day: 7.30 A.M. (3-hourly for 12 hours), breast five to seven minutes; 7.30 P.M., 3-hourly, breast for ½ hour or 20 minutes.

These babies are weighed before and after feeds for first few days.

(B) *Bottle-feeding. A Reliable Skimmed Dried Milk.*

Operation 10.30 A.M., return to ward 11 A.M., four hours er commence feeding.

First day: 3 P.M. to 8 P.M., ℥i. hourly; 9 P.M. and 10 P.M., i.; 11 P.M. to 1 A.M., ℥iii. hourly.

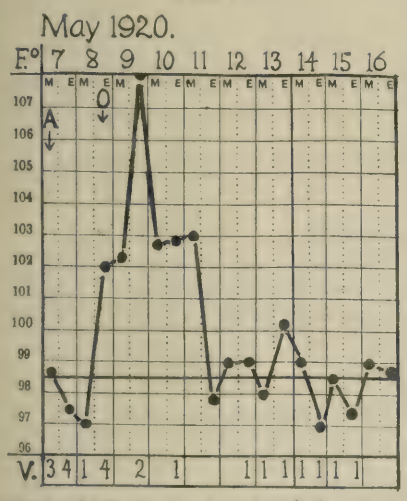
Second day: 2 A.M., ℥iii.; 3 A.M. and 5 A.M., ℥iv.; A.M. and 9 A.M., ℥vi.; 11 A.M., 1 P.M., and 3 P.M., ℥i.; .M. and 7.30 P.M., ℥i. ℥ii. Continue 2½-hourly for 12 hours.

Third day: (Dried milk (half cream), ℥i.–℥i.), 7.30 A.M., s., 3-hourly for 12 hours; 7.30 P.M., ℥ii. 3-hourly. Increase ℥iiss. or ℥iii., according to age.

RESULTS.

In presenting our results we desire to make it clear at our cases have been in no way selected. Certain agnosis of true hypertrophic stenosis has been the dy criterion. Our lists, therefore, include desperate d acute cases. Certain acute exacerbations of

FIG. 1.



Pen perature chart, case of congenital pyloric stenosis. ustrating hyperpyrexia immediately after operation. V = Times of vomiting.

mptoms have been alluded to as forming no contra- dication to operation. Indeed, under certain cumstances such manifestations, in our judgment, dicate that surgical intervention is urgent.

A case may be primarily acute, or acute symptoms ay supervene in a more chronic case. In the imarily acute case the march of events is excessively pid. All the symptoms from the outset are very vere. Vomiting is copious and incessant. Within very few days of the actual onset the infant becomes armingly collapsed. Such cases are surgical emer ncies. The pylorus is found small and stony-hard. spite of the collapsed condition these children do ell. In some other cases, which have presented a ieter course, acute exacerbations occur, associated th severe outbursts of vomiting, and frequently th rise of temperature. In such cases the temptation to postpone operation until the acute symptoms ne, but there is more than a chance that the baby ll die before they do so. We always regard these ses as urgent also. We have on several occasions erated on a child whose temperature has been up 102° F. or more, and the results have been most atifying.

The total number of our joint series, with which are mainly concerned in this present paper, is . Of these, 16 have been cured, four have died. is gives us a percentage of recoveries of 80 per nt., and a mortality-rate of 20 per cent. Since ugust, 1921 (i.e., during the last two and a half ars) we have lost only two cases out of a total of 16.

e wish to refer briefly to the fatalities:—

1. Our first case, in July, 1920, was a bottle-fed infant ed 9 weeks, with a complete harelip and cleft palate, in om the symptoms had existed for 60 days. The operation as performed under local anæsthetic, with a small amount ether. The infant did well until the third day, when it llapsed and died. Post mortem the pylorus was patent, and there was no bleeding. This was a very wasted infant with a severe associated facial deformity. Note the long duration (60 days).

2. Our fourth case, in August, 1921, was a bottle-fed baby aged 10 weeks, in whom the symptoms had been present for 14 days. The infant was extremely emaciated and weighed only 6 lb. The operation was performed under N_2O and oxygen. The baby never really rallied, and died after 18 hours. Post mortem the pylorus was patent and there was no bleeding.

3. Our eighth case, in June, 1922, was a bottle-fed infant aged 6 weeks who had vomited since birth. The diagnosis was in doubt in this case, and in consequence there was some delay before operating. The pylorus was found high up under the liver. Death occurred from shock 24 hours after operation. Post mortem the pylorus was patent, and there was no bleeding. The baby was found to have a double hydronephrosis of advanced degree.

4. Our eighteenth case, in June, 1923, was a twin baby aged 15 weeks, in whom the symptoms had been present practically from birth—i.e., the duration was certainly over 100 days. The infant's condition was very poor. The operation was performed under N_2O and oxygen. The pylorus was enormously thickened, as was the whole stomach wall. All went well until the third day, when an infective enteritis developed. To this was superadded on the fifth day an ulcerative condition of the mouth, pharynx, and larynx; swabs showed no Klebs-Loeffler bacillus, but some "suspicious bacilli." Death occurred later on the fifth day. Post mortem the pylorus was patent, and there was no bleeding. The intestines showed a mild enteritis. The larynx and œsophagus as far as the cardiac orifice were covered by a grey membrane (further swabs showed no Klebs-Loeffler bacillus). Death in this case must be ascribed to an intercurrent diphtheroid infection. We would emphasise the long duration—100 days. Such an infant maintains its hold on life by the slenderest of threads.

We submit that fatalities in four such cases as those related can hardly be said to shake one's confidence in the value of the operation. But it may be said that our joint series of 20 cases is too small, and we wish therefore to take this opportunity of presenting the results of a much larger series; this comprises the first 55 cases which have been operated upon by one of us (T. T. H.) during the last four years. This total number includes the previously quoted 20 cases. In all, the operative details have been identical, and the post-operative feeding has only differed in minor details according to the predilections of individual physicians. We are indebted to our medical colleagues for permission to quote these cases.

FIG. 2.

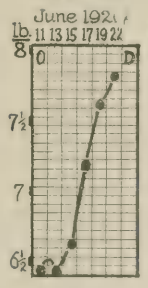


FIG. 3.

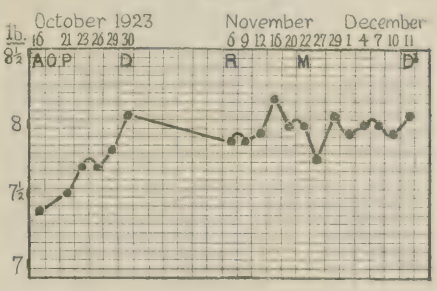


FIG. 2.—Weight chart from a case of pyloric stenosis: duration 14 days. Illustrating rapid gain in weight after operation. O = Operation. D = Discharge.

FIG. 3.—Weight chart of a case of pyloric stenosis in which the symptoms had existed for 60 days, illustrating the slow gain in weight after operation.

A = On admission. O = Operation. D = Discharged. R = Readmitted. M = Humanised milk 3 oz. every 2½ hours. D¹ = Discharged improving gradually.

Of the 55 cases, 41 were cured and 14 died. The total recovery-rate has therefore been 71 per cent., and the total mortality-rate 29 per cent.

It is gratifying to our efforts to note the improvement in the results by years. Thus, in 1920 and 1921, in a total of 20 cases, the mortality was just under 45 per cent. In 1922 and 1923, in a total of 35 cases, the mortality was just under 15 per cent.

What are the factors which influence the results of the operative treatment of pyloric stenosis? We are

convinced that there is only one of paramount importance—duration of symptoms. Those cases in which early diagnosis is followed by prompt operation very rarely give us any anxiety.

The "Rammstedt" operation, if carried out as we have described, has few risks for the infant in fair condition. In such there is no shock. There need be no hæmorrhage or other surgical complications. The subsequent progress is rapid and there is no prolonged period of anxiety (Fig. 2).

All the troubles arise from delay, which fosters disaster in two ways: (1) The infant's general condition becomes progressively depressed, so that the actual operation risk from shock becomes correspondingly increased. (2) The infant's intestinal functions become progressively atrophied from disuse. Recuperation of digestive power must be correspondingly prolonged, while susceptibility to infections is increased. Hence the tragedies of "marasmus" and "enteritis," which account for half the deaths in this series.

The influence of this factor of time is clearly shown in our cases. We have arranged them in groups for the purpose, estimating the duration of the disease from the first onset of symptoms to the dates of operation. We have made three groups: (1) Duration 50 or more days, (2) duration 25–50 days, (3) duration under 25 days.

In group (1) (duration 50 or more days), total 11 cases. Result: Cured 4, died 7. Mortality-rate, 63·6 per cent.

In Group (2) (duration 25–50 days), total 13 cases. Result: Cured 8, died 5. Mortality-rate, 38·5 per cent.

In Group (3) (duration under 25 days), total 31 cases. Result: Cured 29, died 2. Mortality-rate, 6·4 per cent.

Of the total 14 deaths: Seven occurred within 48 hours of operation, and were due to post-operative collapse, seven occurred later at varying periods up to one month from infective enteritis or marasmus. All were examined post mortem, and in no case was there any perforation or undue hæmorrhage as a result of the pyloric incision.

But it is not only to the fatalities that we would point for evidence of the ill-effects of delay. The cases in Groups (1) and (2), which recover, do so reluctantly (Fig. 3). Convalescence is slow and anxious. Often diarrhœa occurs, which is sometimes severe. Altogether, in our experience, it is beyond question that the cases of long standing are in a category by themselves in point of seriousness.

CONCLUSIONS.

1. That in the present state of our knowledge (or ignorance) of the pathology of pyloric stenosis, operation offers the most speedy and certain cure of the disease.
2. That the operation of choice is Rammstedt's.
3. That the best results are obtained when the operation is performed at the earliest possible moment after the onset of the symptoms.
4. That the only absolute diagnostic sign is the feeling of the pyloric tumour, without this sign having been elicited operation is only justified in rare instances.
5. That in a breast-fed infant, where symptoms and signs develop suggestive of pyloric stenosis, the infant should not be weaned until a definite or negative diagnosis can be made, because experience has shown that feeding with breast milk is of great assistance to recovery.

THE Memorial Roll of the Royal Army Medical Corps, designed by Mr. Graily Hewitt, will be exhibited in Room 72 of the Victoria and Albert Museum (Department of Engravings, Illustration and Design) from Feb. 1st to 29th.

A RECEPTION will be held at the Royal Sanitary Institute, 90, Buckingham Palace-road, London, S.W., on Tuesday, Feb. 5th, at 5 P.M., to meet medical officers visiting this country under the auspices of the Health Organisation of the League of Nations.

NEW METHODS FOR THE STUDY OF THE PATHOLOGY AND TREATMENT OF TUBERCULOUS DISEASE.

BY SIR ALMROTH E. WRIGHT, M.D. DUB., F.R.S.

(With Coloured Plate.)

BEFORE any substantial improvements can be made in the treatment of tuberculous infection two things must be done. We must extend our immunological knowledge so as to discern what is lacking in the patient, and what requires to be done for him. And when we have in the light of such knowledge selected our treatment we must use sure means for discovering whether our therapeutic procedures fulfil their purpose. We must part company with those who overleap by a *saltus empiricus* intermediate events, and undertake to adjudicate by far-off indirect and often ambiguous clinical results; and we must set ourselves instead to follow out step by step, using laboratory methods, the train of effects produced by treatment—adhering doggedly to the *passus scientificus tutus*.

Here, as in all other infections, the proper way to begin will be to find out whether the infective agent can cultivate itself in the blood, in the blood fluids, and in the blood fluids in the presence of leucocytes. In previous papers [1] dealing with staphylococcic and streptococcic infections a general technique for these purposes has been described. That technique with certain changes can, as will be seen, be employed also in researches on the tubercle bacillus.

Hæmoculture in Slide Cells and Capillary Tubes.

The method consists in implanting graduated dilutions of a bacterial culture into the blood, and then filling this implanted blood into capillary tubes, or into slide cells. These last (vide loc. cit.) are shallow cells made from ordinary microscopic slides held apart and subdivided into compartments by strips of paper of standard thickness. Where staphylococci are

[1] THE LANCET, 1923, i., 365, 417, 473.

Descriptions of Illustrations on Coloured Plate.

FIG. I.—Normal blood implanted with a heavily centrifuged suspension of tubercle bacilli and incubated for nine days on a slide-cell. Marginal portion of the clot. The hæmoglobin has here been dissolved out from the red corpuscles by water, and the preparation has been stained by carbol fuchsin, followed by methylene-blue. The more copious tubercle growth at the inferior margin is related to the blood-clot having along this edge been in contact with air. Here, as also in the specimens depicted in Figs. III., IV., and VII., practically all the polynuclear and many of the large mononuclear leucocytes have emigrated to the walls, and only the small lymphocytes remain behind in the clot.

FIG. II.—Capillary tubercle-implanted plasma-clot. The preparation was obtained by implanting normal plasma with a centrifuged suspension of tubercle bacilli, by drawing this up into the stem of a capillary pipette, and incubating for four days. The clot was then simply blown out, dried on a slide, and stained with carbol fuchsin. The illustration shows a portion near the end of the clot where the microbes would have access to oxygen.

FIG. III.—Portion of a slide-cell clot from normal blood lightly implanted with tubercle and then incubated for 24 hours. Shows the aggregation of mononuclear leucocytes round a clump of tubercle bacilli.

FIG. IV.—Portion of a slide-cell clot similarly implanted and incubated for 48 hours. The specimen shows commencing "cavernation" round an agglomeration of leucocytes which are centred upon a group of tubercle bacilli.

FIG. V.—Portion of a capillary plasma-clot which was lightly implanted with tubercle bacilli. This was lodged in an "unlined" portion of a capillary stem and was then incubated for three days. The tubercle bacilli are here growing out unrestrained.

FIG. VI.—Another portion of the same clot which was lodged in a leucocyte-lined portion of the capillary stem. The leucocytes have here migrated from the walls on to the plasma-clot. Associated with this "admigration" there is a notable restriction of the tubercle culture.

FIG. I.

FIG. II.

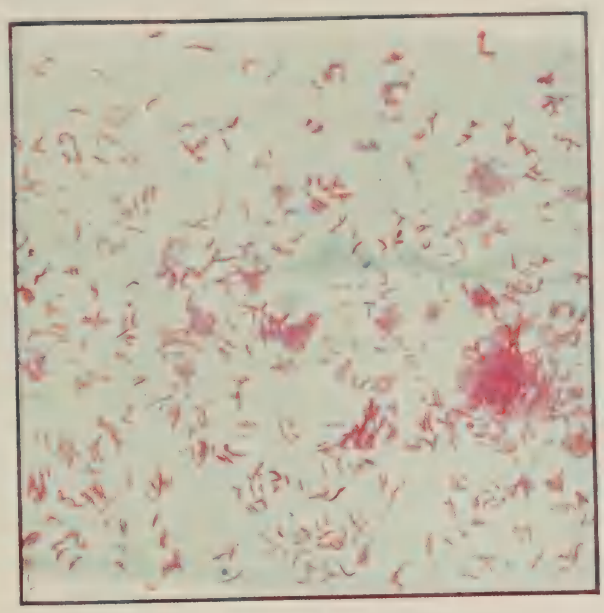


FIG. III.

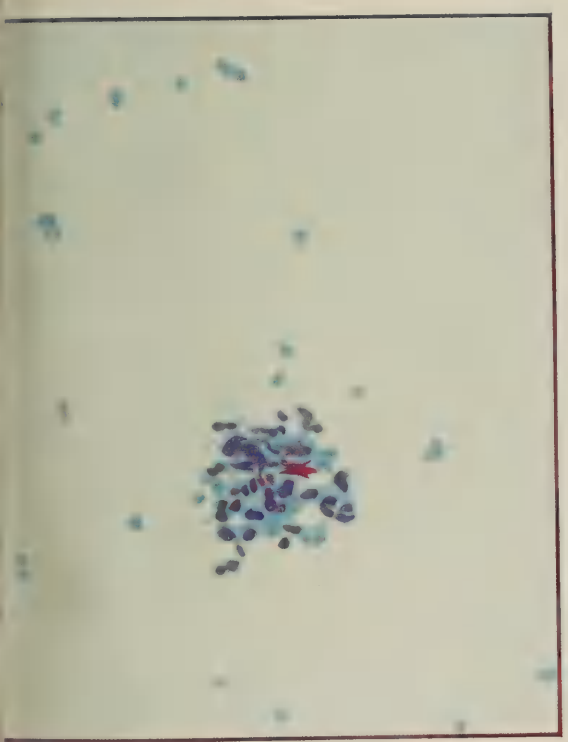


FIG. IV.

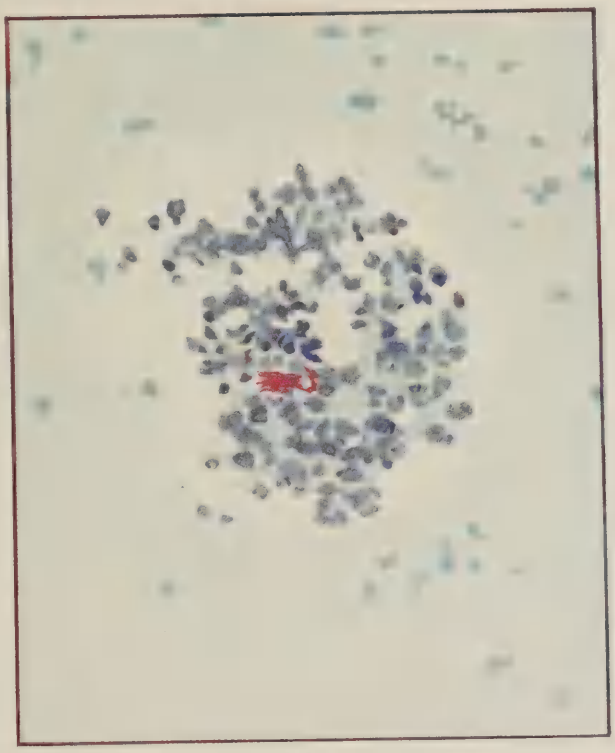


FIG. V.

FIG. VI.

nplanted into human blood the survivors grow out ito colonies which show up as bleached foci encircled y broad purple rings. In the blood of rabbits each aphylococcus colony is surrounded by a broad halo f hæmolysis. Again, in human blood colonies of emolytic streptococci may be ringed round with eas of hæmolysis. When tubercle bacilli are incuated in human blood the hæmoglobin of the red rpuscles is unaffected. We cannot, therefore, s in the case of staphylococci and streptococci, tell y simple inspection whether a culture has been btained.

To decide that we must dissolve out the hæmoglobin om the clot, and then stain and examine under the icroscope. In the case of slide cells we prise the slides sunder under water, add a little acetic acid or saponin, nd then, when hæmolysis is complete, transfer our in slabs of clot, which now look exactly like icroscopic sections, to clean slides. We then fix them the glass by drying in an incubator, and stain with rbol fuchsin, counter-staining with methylene-blue. lood-clots from capillary tubes—we may conveniently ll these *capillary clots*—are treated in exactly the me way. When tubercle-implanted blood-clots thus repared are microscopically examined—incubated eing compared with unincubated specimens—it is stantly seen that the tubercle bacillus grows out the blood. Even after so short a time as 24 hours ne single microbes which were implanted and which ersist as such in the unincubated clots have in ncubated clots grown out into groups of 2 to 5. fter 48 hours the clumps of tubercle bacilli are fficiently large to be easily visible under the low ower (magnification of approximately I × 100). n idea as to how vigorously the tubercle bacillus rows in blood can be obtained from Figs. I. and II. ig. I. represents a portion from the edge of a slide ell clot where (owing to the containing compartment aving here been only incompletely filled with blood) xygen had access. Fig. II. represents a portion ken near the end of a capillary blood-clot where, f course, similar conditions would prevail.

The leucocytic reactions and the histological hanges which supervene in tubercle implanted clots re interesting. Polynuclear leucocytes are first ttracted to the tubercle bacilli and phagocytosis llows. The tubercle bacilli now rapidly bring about ne destruction of the ingesting polynuclear leucocytes nd then large and small mononuclear white corpuscles llect and form in concert with the disintegrating olynuclear phagocytes large agglomerations round ne tuberculous foci exactly as described by Borrel in nnexion with the intravenous injection of tubercle acilli. These agglomerates of leucocytes—described y Borrel as miliary tubercles in the making—are own in Figs. III. and IV. A little later—in those gions where the leucocytes do not extinguish the fection—the fibrin meshwork begins to thin out and issolve round the agglomerations of leucocytes which ncompass the clumps of tubercle bacilli (Fig. IV.). he beginning of this process of *cavernation* can be en after 24 hours and after 48 hours definite cavities ave formed, and the process goes on until the slide-ell clots are everywhere perforated with holes. The colorised clots now look like miniature sections of lung riddled with cavities (Fig. IX.). In like manner bercle-implanted capillary blood-clots are gradually oded, and fall to pieces.

Ordinarily two factors—the tubercle bacillus on ne one hand and leucocytes on the other—appear coöperate in the process of cavernation. The bercle bacillus by itself does not—this will be pparent on considering Figs. I. and II.—dissolve p the fibrin. Nor, judging by the case where leucoytes gather round insoluble foreign particles in a lood-clot, do aggregations of unpoisoned leucocytes sintegrate the fibrinous structure. Nor, again, do the ggregations of leucocytes which may collect round aphylococcus colonies dissolve it. Cavernation ould thus appear to be due to a quite special chemical tion exerted upon leucocytes by the tubercle bacillus. n all probability trypsin derived from the disintegrated leucocytes comes into operation on the fibrin. In exceptional cases, where the blood has been very heavily implanted with tubercle, cavitation occurs without any apparent intervention of leucocytes. Here we have cavities filled with badly staining material in which tubercle bacilli are lying loose. Such cavitation is probably produced by a caseating necrosis.

Plasma Culture.

The tubercle bacillus having been found to grow freely in human blood, implantations were made into serum. The event, however, did not conform with expectation. The tubercle bacillus does not proliferate appreciably in serum. Implantations were, as a next step, made into plasma. The technique employed was to obtain blood from the finger to aspirate this into a paraffined pipette, and to centrifuge this without delay in a centrifuge bucket filled with cold water. This done the supernatant plasma was pipetted off, implanted with graduated dilutions of the centrifuged tubercle bacillus suspension, drawn up into capillary tubes, and incubated—control tubes being kept at the temperature of the air. The plasma-clots were then, after one or more days, blown out, were carefully washed to remove the adhering serum, and were then stained with carbol fuchsin and counter-stained. A mere glance at such preparations suffices to show that the tubercle bacillus grows very freely in the plasma-clots (Figs. II. and V.). And when these are compared with blood-clots similarly implanted it is immediately seen that the tubercle bacillus proliferates much more freely and more uniformly in the former than in the latter. Whereas in the case of the blood-clot the colonies are irregularly distributed and come up larger and smaller according as the conditions are in one region favourable and in another unfavourable, in the plasma-clot the colonies are regularly distributed, and are much more of one size. This is obviously what one would expect of microbes implanted into a nutrient medium which was everywhere favourable to their growth.

It would be improper to infer from the fact that the tubercle bacillus proliferates vigorously in a plasma-clot that it is cultivating itself in plasma. In the plasma-clot (and, of course, the same applies to the blood-clot) the microbe is in reality cultivating itself in a medium of serum. The proper conclusion from the facts would apparently be that the tubercle bacillus obtains from the fibrin of the clot some essential nutrient element which is not found in the serum.

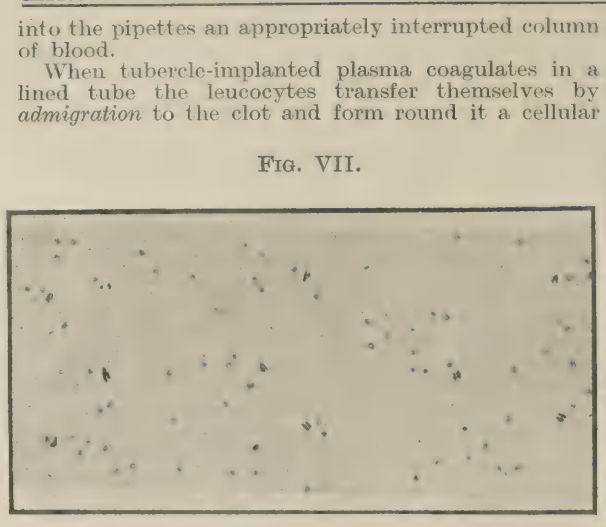
Influence Exerted by Leucocytes Upon the Growth of the Tubercle Bacillus.

We have already seen that the tubercle bacillus grows more copiously and in more uniform distribution in the plasma-clot than in the blood-clot, and we have further seen that in the blood-clot the leucocytes aggregate round the implanted tubercle bacilli, and that the polynuclear leucocytes in particular ingest them. It was, however, desirable to determine by direct experiment whether we can by bringing in the agency of leucocytes check the growth of the tubercle bacillus. This can be put to the test in two different ways. It can be tested by drawing up tubercle-implanted plasma into leucocyte-lined capillary tubes, and comparing the growth in such tubes with that obtained in ordinary unlined capillary tubes. Leucocyte-lined tubes are made by filling blood into ordinary capillary pipettes, incubating, so as to allow the leucocytes to emigrate and fix themselves to the walls, and then drawing a stream of normal salt solution into the distal end of the capillary tube, thereby carrying the clot up into the barrel of the pipette and washing away the red corpuscles and other blood elements. Better for our purpose than tubes furnished with a complete lining of leucocytes are tubes in which only one-half of the stem is lined. And better still are tubes in which leucocyte-lined sections alternate with unlined sections. Such a disposition of leucocytes is obtained by drawing up

into the pipettes an appropriately interrupted column of blood.

When tubercle-implanted plasma coagulates in a lined tube the leucocytes transfer themselves by *admigration* to the clot and form round it a cellular

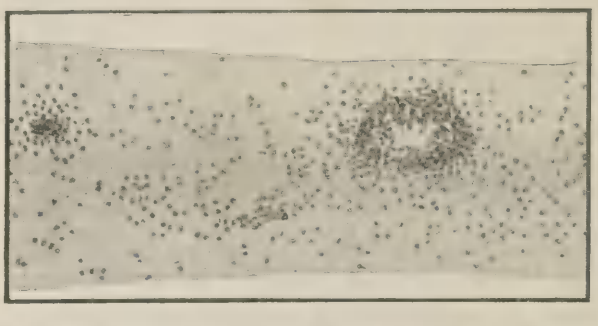
FIG. VII.



Capillary clot from tubercle-implanted normal blood, blown out after three days' incubation, and then hæmolysed by saponin and stained. Practically all the leucocytes have here emigrated from the clot, only a few lymphocytes being left behind. In association with this the tubercle bacilli have grown out unrestrained.

envelope which comes out uninjured when the clot is evacuated through the expanding upper portion of the capillary stem (Fig. VI.). We can accordingly, when we have before us a clot derived from a lined tube, very easily distinguish those regions where the microbes have been subjected to the influence of leucocytes from those where these have not come into operation. Fig. V. shows the growth of tubercle in a section of plasma-clot which has lain in an unlined region of the tube. Fig. VI. shows the growth in an adjoining lined portion. In those regions of a plasma-clot where a sufficient force of leucocytes —and here it is a question of polynuclear leucocytes only—comes into operation the culture of tubercle is,

FIG. VIII.



A similarly implanted and treated blood-clot derived from a patient with phthisis showing leucocytic agglomerations round the tubercle bacilli. In association with this there is a greatly restricted growth of tubercle bacilli.

as shown in the figures, always very much less copious than in those regions of the clot where the leucocytes do not come into play.

Another method of investigating the effect exerted by leucocytes upon the culture of the tubercle bacillus is to fill in tubercle-implanted blood into capillary tubes or flat emigration tubes and centrifuge immediately. We then obtain in the upper half of the tube plasma, and in the lower half of the tube red corpuscles intermixed with polynuclear leucocytes and small lymphocytes; and on the top of this a layer of large mononuclear leucocytes intermixed with the larger lymphocytes. When we now incubate these tubes the tubercle bacilli grow out freely in the plasma-clot; they are, when the implantation is not excessive, killed off in the substance of the red clot, and also, but not so completely, in those regions of the plasma-clot which are invaded by leucocytes. This method may be called the *method of explanting from blood into plasma.*

While it holds true generally that leucocytes exert an inhibitory influence upon the growth of the tubercle bacillus, the rule is subject to important exception. Where leucocytes succumb to tuberculous attack the growth of the tubercle bacillus is distinctly favoured. Examination of implanted blood-clots brings out the fact that polynuclear phagocytosis of tubercle bacilli is generally unsuccessful, and that it then furnishes

FIG. IX.

Photograph of a slide cell tubercle-implanted blood-clot, which was incubated for four or five days and was then hæmolysed by saponin. By "cavernation" the clot has been converted into a sort of honeycomb structure.

new foci of infection, and that the colonies of tubercl that develop from these disintegrated leucocytes ar quite markedly larger than those in other regions o the preparation.

Effect of Implanting Tubercle Bacilli into the Bloods of Phthisical Patients.

When similar implantations of tubercle bacill are made into normal blood and into the blood o patients with pyrexial phthisis—or, to speak mor generally, patients who have reacted to tubercl auto-inoculations—very remarkable differences com to light. There is, in the first place, as will be seen on reference to Figs. VII. and VIII., a difference with respect to the leucocytic reaction. Whereas th leucocytes of normal blood when the blood is heavily implanted collect only sparingly round the tubercl bacillus, most of them emigrating from the clot, th leucocytes of the tuberculous patient congregate in great masses round the bacilli. In correlation with this greater leucocytic reaction a more powerfu destructive effect is exerted upon the implanted bacilli, and when we compare tuberculous and norma blood, counting in each case the number of tuberculou colonies in the incubated and unincubated blood w find there is in the blood of the tuberculous patien a much larger dissolution of microbes.

There is here much food for thought. It is in th first place obvious that though there are clinica similarities between pyrexial phthisis and chroni streptococcal septicæmia the immunological condition

are in the two profoundly different. In the septicæmic patient the hæmo-bactericidal power is as compared with the normal, very conspicuously reduced. The treatment of streptococcal septicæmia should by consequence be *epiphylactic*. In other words, it must aim at increasing the bactericidal power of the blood. The pyrexial tuberculous patient here in view has, as compared with the normal, a greatly increased hæmo-bactericidal power. *Epiphylaxis* is therefore here not the essential requirement. And we have to ask ourselves what can here be at fault and what treatment is required? The answer to these questions would seem to be that the infecting tubercle bacilli are cultivating themselves in *ecphylactic* foci, and that *kataphylactic* treatment is called for. In other words, the bactericidal agents, that is the leucocytes, should here be transported from the blood into the regions of infection. That is precisely what we do when we introduce a tubercle-implanted plasma-clot into a lined capillary tube (Figs. V. and VI.).

The essential preliminary to treatment on these lines will obviously be the prosecution of research into the phenomena of emigration. We require to study the laws that govern the emigration of the leucocytes from the blood, or, as the case may be, blood-clot. We require to find out how to make leucocytes invade the tubercle foci as they *admigrate* to the bacilli in the bloods of tuberculous patients. And we require to study generally the chemotactic properties and the migrational movements of the different species of leucocytes.

Comparison of Normal Blood Inoculated in Vitro with Koch's Bacillary Emulsion with Uninoculated Normal Blood.

As an inducement to other workers to take up the study of this question, it may be placed upon record here that the increased leucocytic reaction and the increased tuberculo-bactericidal power which distinguish the blood of tuberculous patients who have reacted to auto-inoculations can be obtained by the addition of bacillary emulsion to the normal blood in vitro. But in connexion with this it must be borne in mind that here, as in all immunisation, the immunising result will depend upon two factors operating in conjunction. The first is the dose of living microbes implanted. The second is the quantum of vaccine which is superadded. The following results apply to blood implanted fairly sparingly with living tubercle bacilli. With small additions of bacillary emulsion—i.e., doses ranging above and below 1 in 50,000,000 of bacillary emulsion in blood—very large reduction of the tuberculous growth is obtained. With larger doses—doses up to 1 in 5,000,000 of bacillary emulsion in blood—increased agglomeration of leucocytes round the tubercle bacilli is obtained. But with these larger doses the tubercle bacilli dispersed in the other regions of the preparation appear to grow more plentifully.

In conclusion, I desire to thank my friend and colleague Alexander Fleming, F.R.C.S., for the drawings which illustrate this paper.

A NEW METHOD OF PREPARING VACCINES.

BY DR. RÉNÉ ZIVY (PARIS).

SINCE the first vaccine was prepared by devitalising bacteria at 120° C. (antityphoid vaccine of Chantemesse and Widal, 1888) up to the introduction of the present method of successive heatings to 56°–57° C., bacteriologists have constantly been endeavouring by various means to reduce as much as possible the degree of heat necessary for sterilisation, it being known that devitalisation at a high temperature diminishes vaccinating properties and increases toxicity. I considered it probable that alteration of the albuminoid substances by a high temperature was the cause of the incomplete results and the general or local consecutive troubles usually observed. Chemical products, such as iodine, ether, phenol, used also for sterilising vaccines, seem to me to have the same inconveniences.

I have therefore considered killing bacteria by means of freezing. All previous researches on the action of continuous cold on bacteria (Pictet and Yung, d'Arsonval and Charrin) demonstrated that bacteria became accustomed to this new condition of existence, lived, and were reproduced at the lowest temperatures. The question was, therefore, to prevent such a continuation of existence, and for that purpose I submitted bacteria to successive freezings and thawings. On searching the work already published on this matter, I found in the *New York Medical Record* of 1887 an article by Mr. Prudden, reporting experiments made with a view to the sterilisation of drinking water, and his conclusions were completely in accordance with the results of my own experiments.

I succeeded in obtaining complete sterilisation by a very simple process: The cultures on gelose are emulsified in physiological salt solution. This solution is dosed with the opacimeter, 50 milliards per c.cm. The solution contained in an aluminium tube (glass tubes cannot be used, as they break and were the cause of failure in my first experiments) is placed in a freezing apparatus with a constant temperature of −18° C. This temperature of −18° C. is obtained in the interior of the aluminium tube in about one hour and a half. The tubes are left in the freezing apparatus for five hours, taken out and left another five hours at room temperature (about 16° C.). Thus freezing and thawing has taken place.

According to the species of bacteria this operation must be repeated twice for pneumococci and streptococci, four times for *B. coli*, and six times for staphylococci and enterococci. On completion of the requisite number of periods in the freezing apparatus, sterilisation is complete (as we have proved by sterility of cultures tested during the last three months). The original solution is then diluted with physiological salt solution in order to obtain the required dosage.

In the course of my experiments I found it useless to put the cultivated gelose itself into the freezing apparatus. After 20 periods of freezing the microbes were still living. In order to study the toxicity of these vaccines, I have used a mixed vaccine containing in each cubic centimetre: pneumococci, streptococci, enterococci, staphylococci, *B. coli*, each 100 mill., altogether 500 mill. bacteria; 1·5 c.cm. of this vaccine (750 mill. bacteria) were injected into the vein of a rabbit weighing 2·800 kg. and caused no trouble, not even trembling. The non-toxic dose is, therefore, over 300 mill. bacteria per kg. weight of animal. The dose I have generally employed in man is only 500 mill. bacteria.

FOOT-AND-MOUTH DISEASE IN RATS.

BY J. M. BEATTIE, M.A. N.Z., M.D. EDIN.,
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AND
DAVID PEDEN.
(*From the Bacteriological Department, University of Liverpool.*)

ABOUT the middle of December last a number of glands, mainly pre-scapular, from cows were brought to the laboratory for examination. They had been collected by the chief city meat inspector, who considered them abnormal, and following his routine practice he sent them for examination and report. The glands were enlarged, some of them inflamed, the pulp being soft and œdematous, while others showed irregular and more or less extensive hæmorrhages. Scrapings from the glands were made, but no special changes, other than those observed with the naked eye, were present. Neither bacteria nor protozoa were found. Cultures gave growths of a short-chained

streptococcus which, at first, was best developed under anaerobic conditions; later, this organism grew quite actively as an aerobe. We did not attach much importance to this organism as no special precautions had been taken in collecting the glands. A further series of glands, received at a later date, showed exactly the same conditions.

All the glands had been taken from carcasses of cows slaughtered because they had been in contact with cases of foot-and-mouth disease. None of the animals showed any of the usual signs of this disease, and they had been sent to the abattoir as non-infected. The fact that these cows were from an infected farm or dairy added special interest to the examination, and we carried out a series of experiments which have led us to believe that some of these glands contained the virus of foot-and-mouth disease, and that the disease could be produced in some laboratory animals. The work is still incomplete, but the results so far obtained and confirmed, are, we think, of sufficient importance to justify publication.

Description of Experiment.

On Dec. 18th, 1923, a rat (*a*), a mouse (*a*), and a rabbit received a subcutaneous inoculation of a saline emulsion of the glands, and a mouse (*b*), a rat (*b*), and a guinea-pig were fed on the minced glands. They received one feed only, but the guinea-pig was also given a subcutaneous inoculation.

On Jan. 1st, 1924, the guinea-pig died. There was no evidence of any lesions in the feet or in the mouth, but all the glands in the regions of the jaws were enlarged and contained a semi-solid yellowish purulent material. There was marked injection of the intestines, and some serous fluid in the peritoneal cavity. This fluid was crowded with inflammatory cells, mainly of the mononucleated type. Cultures from this fluid and from the glands yielded a short-chained streptococcus, and a small Gram-negative coccus. Both these organisms were pathogenic to rats and guinea-pigs; the Gram-negative coccus produced very marked gelatinous œdema at the site of inoculation, but we have no evidence, at present, to show that these organisms had any causal connexion with the disease. The rabbit showed no sign of infection and is still alive; mouse (*a*) died of streptococcal septicæmia.

On the 4th, rat (*a*), which had received the subcutaneous inoculation, died. There was well-marked œdematous swelling on the dorsum of both hind feet. The tail had been completely bitten off at the root. No special lesion was noted in the mouth, and, unfortunately, the lungs, which in the later animals showed important lesions, were not examined. A rat (*c*) was vaccinated on the dorsum of one of the left hind feet with the clear serum from the swollen foot of rat (*a*); only a very minute drop of the serum was used.

On the 10th, rat (*b*), which had been fed on the cow glands, was killed. It had shown for one week marked œdema of the dorsum of both its hind feet (the right foot was held off the ground on the day on which the animal was killed). The œdematous condition was exactly similar to that observed in rat (*a*), but, in addition, there was a very distinct small vesicle with clear fluid in the dorsum of the tongue, and on the anterior under surface a definite small ulcer. The tail was very much swollen, and about half of it had been bitten off. Both lungs showed infarct-like areas of gelatinous œdema with, here and there, distinct vesicle formation on the pleural surface.

On the 12th, a rat (*i*) was fed on a second series of cow glands, and a rat (*j*) was inoculated with an emulsion from the same series of glands.

On the 16th, rat (*c*), vaccinated on the 4th, was killed. This rat had been ill for several days after the vaccination, and there was definite swelling of the vaccinated foot. This evidently was due to the irritation, and subsided in a few days; but the swelling returned and the dorsum of the opposite foot became swollen. The rat in its general condition was much improved, and would probably have made a complete recovery. On examination, besides the œdema noted, two small scars, very suggestive of ruptured and dried-up vesicles, were seen one on the under surface and the other between the toes of the right hind foot. There were two small unruptured vesicles on the dorsum of the tongue near the root, and in the lungs there were numerous irregular areas of gelatinous œdema.

On the 17th, rat (*i*), fed on Jan. 12th, was examined under an anæsthetic. The feet were red and inflamed, and there were three distinct vesicles, two of them hæmorrhagic, on the under surface of the toes of the left foot. Rat (*j*) showed distinct œdematous swelling of the dorsum of both feet.

On the 19th, mouse (*b*), fed on Dec. 18th, died. The mouse had been ill, but appeared to have recovered completely, with the exception of the tail which remained considerably thickened. On examination no lesions were found in the feet or tongue, but two gelatinous œdematous areas, similar to those seen in the rats, were present in the lungs.

On the 21st, rat (*i*), fed on the 12th, was killed. There was very marked œdema of both hind feet, especially the right foot. This was more marked than in any of the previous animals. There were definite vesicles on the under surface of both hind feet and between the toes. The tongue showed two minute vesicles, one on the lateral aspect and one on the dorsum near the root. Both lungs showed a very large number of the areas of gelatinous œdema noted in the other rats. Rat (*j*), inoculated on the 12th, was also killed; it showed besides the œdematous swelling of the feet, several very well-marked vesicles on the under surface of both the hind and fore feet. There was no lesion in the mouth, but the œdematous patches were present in the lungs.

Summary.—Four rats which have been fed on, or inoculated with, cow glands have developed œdematous swelling of both hind feet, two have shown, in addition, clear vesicles on the under surface of the feet or between the toes, two have vesicles on the tongue, three, and one mouse, had vesicles or patches of gelatinous œdema in the lungs (the lungs of the fourth were not examined). One rat was vaccinated with a very small drop of the œdematous fluid from the foot of an infected rat, and this animal also developed the œdema of the feet, the vesicles on the under surface of the toes, vesicles in the tongue, and the gelatinous œdema in the lungs.

Discussion.

Since making these observations we have examined 80 healthy rats, and no trace of similar lesions in the feet, mouth, or lungs were found, and in a very large experience with rats no similar condition has been seen by us. The special localisation of the lesions in the feet and the tongue are similar to those found in foot-and-mouth disease; the special and unique condition in the lung has, so far as we know, never been described. The results were obtained with specially inflamed glands from cows which had been contacts with foot-and-mouth disease. With such glands no rat has failed to produce the condition.

If the condition we have produced in these rats is foot-and-mouth disease, and we see no reason to doubt this, and if the experiments are confirmed, a very important avenue for investigation has been opened up, for the following reasons:—

1. The carriage of the disease from place to place either by the infected rat itself (and we know that rats migrate over considerable distances), or by the foodstuffs in which the rats live and die, is, at any rate partially, if not wholly, explained.

2. The vesicular condition on which diagnosis at present depends may merely be a manifestation of some deeper infection—just as herpes may be an outward sequel of a pneumonia, and that the distribution for food of the flesh of contact animals may be a source of spread of the disease.

3. If the disease can regularly be produced in rats the great difficulty of experimental investigation and the supposed risks are considerably reduced. Rats can be very easily isolated, and work in relation to the cultivation of the virus can be carried out with very little difficulty, and, in our opinion, without the slightest danger.

Our great regret is that we have not been able to experiment with material from animals known to be suffering from the disease. We have asked for it but have been told that the risk is too great, and we therefore publish these experiments in the hope that we, or others, who are working at the subject may be given reasonable facilities to carry out a thorough investigation into a disease which has cost so much to the nation.

NOTE.—Another rat which received one feed of blood from rat (*b*) on Jan. 10th now (Jan. 22nd) shows very typical swelling of the dorsum of both hind feet, two small vesicles on the tongue, and one very typical vesicle full of gelatinous fluid on the pleural surface of the right lung.

STEINACH'S REJUVENATION OPERATION.

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OF recent years great interest has centred round the operation of ligature of the vas as a method of stimulating the output of the internal secretion of the testis. This has been due in great part to the experimental work carried out by Prof. Steinach, of Vienna, on the results of ligature of the vas in senile animals. Other workers before Steinach, and notably Ancel, Bouin, and Kuntz, had described the effect of vasoligature in the case of young animals, and had shown that the operation produced a state of heightened sexual vigour, but Steinach was the first to apply the method to senile animals in the hope of stimulating their failing energies. His work was done on the rat, an animal particularly well suited for experiments of this kind, owing to the fact that its life is a short one and that symptoms of age are easily recognisable. The results of his experiments were published in 1920 in a monograph entitled "Rejuvenation by Experimental Revivification of the Senile Puberal Gland."[1] The title was perhaps an unfortunate one in that it encouraged the raising of extravagant hopes and resulted in the premature exploitation of a method of "rejuvenation" that had not been sufficiently tested. However, the fact that Steinach's work was soon exploited by some of the less reputable members of the medical profession does not detract from its value and interest. Indeed, the mere fact that because of its exploitation it has received but little attention in this country is sufficient justification for such an article as the following, and for this reason no apology need be offered for dealing with the matter in greater detail.

Steinach's Animal Experiments.

In his animal experiments Steinach used white rats and crossings between these and the wild rat. The average life of these animals is 28 months, and signs of old age usually appear about the twentieth month. The indications of old age most easily recognisable in the rat are loss of weight, appetite, and energy, depressed carriage of the head, lack of interest in its surroundings, loss of pugnacity, diminution or complete disappearance of sexual vigour, and deterioration of the coat, with loss of hair, uncleanliness, and increase of parasites. These outward signs are accompanied by less obvious changes in the genitalia and particularly in the secondary sex glands, such as the prostate and vesicles. The latter instead of forming large and convoluted sacs distended with fluid, as in the young animal, appear wrinkled and shrunken in size, containing only a minimum of seminal secretion.

Previous to operations Steinach's animals were subjected to a series of tests, in order that precise data might be available for estimating any improvement occurring subsequent to the ligature. Tests of muscular energy were carried out by placing the animals' food in such a position that it could only reach it by climbing or leaping. As a test of courage young pugnacious males were introduced into the same cage and the disposition and ability to defend itself shown by the old animal was carefully noted. Sexual vigour was estimated by placing the rat in proximity to females both on heat and in the resting state. A record was also kept of the amount of food consumed in 24 hours, the weight of the animal, the condition of its coat, its ability to keep itself clean and free from parasites, the interest it displayed in new surroundings, and its general behaviour when alone in its cage.

When an accurate estimate of the condition of the animal had been reached, bilateral section of the vas between ligatures was carried out. In one or two cases, in order that a record might be kept of the condition of the internal organs, and especially of the prostate and vesicles, a laparotomy was performed at the time of ligature and subsequently when signs of rejuvenation had manifested themselves. As a rule no alteration of the condition of the rat was noted for a period of two to four weeks after operation. The first sign of change that manifested itself was a return of sexual excitement when in the presence of a female rat. With the increase in sex vigour came a renewal of pugnacity, an alteration in the carriage of the head, an increase in appetite and in muscular energy, and an improvement in the coat with a new growth of hair, especially on the scrotum and around the external genitalia. In some of the cases recorded by Steinach the return of sexual vigour was so marked in these senile animals that for a time they equalled in potency the young males. At the end of a period that was anything from five to seven months after ligature the condition of the rejuvenated animals showed signs of deterioration. Potency became less strong, muscular energy and courage declined, the appetite diminished, and signs of senility returned. These gradually became more intense, so that finally the animal sank into a condition of apathy and died, usually within a few weeks of the onset of the relapse. Not infrequently the terminal cause of death was shown post mortem to have been some pulmonary condition.

In addition to studying the general results of vasoligature on his animals, Steinach carried out a careful histological study of the associated changes that occurred in the testicle. He found, as had Ancel and Bouin before him, that ligature brought about a degeneration of the seminal epithelium, and an increase in the interstitial tissue. More difficult to explain is Steinach's observations that when only one of the two testicles were tied an increase of interstitial tissue was found on the untouched side as well as on the side of the ligature, although, of course, in the former case there were no signs of degeneration in the tubules. It is of interest to note that the changes in the testicle, whatever their nature, occurred not immediately after the ligature, but after a latent period of two to three weeks. (See Fig. 1.) Of still greater interest is the fact that the degeneration observed in the tubules was not permanent, but that after an interval of six to eight months had elapsed since the application of the ligature, the majority of tubules were found to have completely regenerated. This phenomenon of regeneration has also been noted by other investigators, especially by Kuntz, who found that if a dog whose vas had been ligatured were allowed to survive 142 days, and the testis then examined, the seminal epithelium was normal in appearance and active spermatogenesis was present. The fact that in these cases the vas was still dilated on the side of the ligature showed that the duct was still occluded and that the regeneration was not merely the result of a renewal of patency. Sands states that although after ligature of the vas he found an increase in Leydig cells, associated with degeneration of the tubules, he was not able to demonstrate to a certainty this regenerative phenomena. However, additional weight is given to the evidence in favour of Steinach's and Kuntz's observations by the fact that epithelial regeneration has been observed in other glands after ligature, and notably in the pancreas. Bensley has clearly proved by means of his intravitam methods of staining that although islets and acinar tissue degenerate after ligature of the pancreatic duct, both tissues subsequently become regenerated.

[1] Verjüngung durch experimentelle Neubelebung der alternden Pubertätsdrüse.

Criticism of Steinach's Animal Experiments.

A criticism of Steinach's experimental work divides itself naturally into two parts: first, a consideration of the effects produced in the general condition of the animal by ligature, and second, the relation of these phenomena to the histological changes observed in the testicle. Whatever may be the verdict that science will eventually pronounce on the effect of vaso-ligature when carried out in the human being, and however sceptical we may remain of the so-called rejuvenation obtained by exponents of this operation, it is certainly difficult to offer any explanation of the

FIG. 1.

Section through the testis of a rat five weeks after ligature and division of the vas. The section shows a marked degree of degeneration in the tubules, together with an increase in prominence of the interstitial tissue.

remarkable results obtained by Steinach in his animal experiments other than the explanation which he himself furnishes—namely, that ligature of the vas, by increasing the output of internal secretion, thereby stimulates the endocrine system generally and reawakens the waning energies of the senile animal. Whether, in addition to bringing about a condition of renewed activity, the operation of vaso-ligature has any effect in actually prolonging the duration of life is an entirely separate question, for as Steinach himself has pointed out, the span of life of a single individual can never be predetermined, so that definite proof of prolongation must inevitably be lacking. It is noteworthy, however, that several of the animals ligatured by Steinach reached an unusually advanced age, one of them living three years, and thereby surviving a brother born in the same litter and dying of normal decay by seven months. If we accept the account given by Steinach of his experimental work we are almost bound to accept his theory, for no other explanation of his results is available. Fiebinger's suggestion that the rats used in these experiments were not suffering from old age but from mange, and that the improvement in their coats and general condition was the result not of the ligature but of the good feeding and attention they received in Steinach's laboratory, is scarcely sufficient to explain his results when we keep in mind the completeness and ingenuity of the tests to which the animals were subjected before ar after operation.

Surprising as are claims made by Steinach, ar difficult as it may be to account for all that he describe it is impossible to do otherwise than to acce Steinach's work with an open mind and await co firmation of his results by other observers of equ scientific standing. By the courtesy of Prof. Steina we are enabled to publish photographs of two ra showing the effect of ligature. The descriptions a taken from his work "Verjüngung." (See Figs. and 3.)

If we turn now to a consideration of the second pa of Steinach's work—namely, the relationship of t phenomena of rejuvenation to the histological chang observed in the testis—we find ourselves confront with a far more complex problem. Like Ancel ar Bouin, Steinach found that ligature was follow by degeneration in the seminiferous tubules ar increase in the interstitial cells. Accepting An and Bouin's view that the latter cells are the so source of the internal secretion of the testis, naturally claimed that the histological changes fou in the testis furnished additional proof that by l ligature he had stimulated the output of sex hormo Granted the truth of Ancel and Bouin's theo Steinach's line of argument was logical. If, howev we do *not* accept the dictum that the interstiti cells are the sole source of the internal secretion of t testis, we cannot accept an increase in the interstit tissue as a proof that the output of sex hormone h been stimulated. In a previous article published THE LANCET of Jan. 5th, one of us (K. M. W.) furnish arguments for believing that the interstitial cells w not the sole source of formation of the inter secretion of the testis, and for this reason we are n inclined to accept in its entirety the interpretati that Steinach places on his histological observatio The increase in interstitial material observed af ligature would, in our opinion, indicate not an increas output of hormone but an accumulation of nutri material resulting from a diminished activity of t tubules. If this view is correct the significance Steinach's histological findings would be lost, but t value of his observations with regard to the effect vaso-ligature on the general condition of the sen animal remains unimpaired.

Ligature of the Vas in the Human Subject.

Since the publication of Steinach's work vas ligature has been tried in man with variable resul Before considering the subject it will be advisable deal with an objection that has been raised agai the possibility of ligature of the vas exercising a rejuvenating effect on man. It has been urged th at one time the operation of ligature of the vas w carried out fairly extensively as a treatment f enlargement of the prostate, and that no rejuvenati results were reported to have resulted from the p ceeding. This objection is not so weighty as would at first sight appear when one remembers t method of applying the ligature in these cases. T treatment of prostatic enlargement by means ligature of the vas was introduced by Mears in 18 but in ligaturing the vas so little care was exercised avoid damaging the blood- and nerve-supply of t testicle that a large number of cases of gangre followed. It was, indeed, partly because of the accidents that the method was afterwards abandon As avoidance of interference with the blood-supply the testis is a sine qua non of the procedure advocat by Steinach, the crude method of ligature employ by Mears and his followers cannot be regard as an instance of the application of vaso-ligatu to man.

During the last six years numerous workers ha employed Steinach's methods in the human subje amongst others Lichtenstern, Peter Schmidt, Lev Lenz, Benjamin, and Knud Sand. Owing to the fa that ligature of the vas sometimes causes the form tion of a spermatocele, and that this is likely

embarrass the blood-stream of the testis, Sand and Tournade have abandoned the operation of ligature of the vas in favour of a partial epididymectomy. Sand's technique consists in carefully freeing several centimetres of the upper part of the epididymis from the body of the testis, taking care to avoid injuring the fine vessels and nerves proceeding to the latter structure. After isolation has been completed the freed portion of the epididymis is resected between ligatures. The whole operation is conducted under local anæsthesia through a small incision in the upper part of the scrotum. Other workers content themselves with tying the vas, the ligature being placed low down near its junction with the epididymis. Equal care must be exercised to avoid damaging the blood-vessels.

Results.

Nothing is more difficult than to assess the clinical results of ligature of the vas in man. This is due not only to the absence of definite measurable data by means of which improvement can be gauged, but also to the fact that it is almost impossible in the human subject to exclude the action of mental suggestion. Moreover, difficulty is generally experienced in selecting cases suitable for operation, since pure senility unassociated with such complications as bronchitis, cardiac lesions, &c., is of uncommon occurrence, and variations and improvements in the secondary lesions are likely to obscure and confuse the issue. All that it is possible to do in the present paper is to append reports of cases treated by the writers by means of vaso-ligature, and to supplement this with an account of the results obtained by other workers. It must be realised, however, that in practically all the cases of vaso-ligature recorded by exponents of the operation of vaso-ligature the proof that improvement resulted rests on evidence of a more or less doubtful nature. On this account a very large number of observations will be necessary before it is possible to pass judgment on vaso-ligature as a method of treatment.

Of 18 cases reported by Sand, 13 were cases of senility and five cases of impotence associated with neurasthenia. Out of the 13 cases of senility the author reports nine favourable results, the criteria by means of which success was gauged being increase in the weight of the patient, renewal of mental and physical vigour, a return of virility, and a subjective or objective appearance of well-being. In two additional cases any favourable results that may have followed the operation were only temporary in character, and in two the results were entirely negative. Of the five cases treated for conditions other than senility two only resulted favourably. Benjamin reports 16 cases treated by ligature, with nine positive results, four doubtful, and three negative. Lichtenstern states that he has performed the operation in 60 patients and claims satisfactory results, although we have been unable to obtain details of his patients or to discover precisely the criteria by means of which he gauges his results. In some of Lichtenstern's cases ligature would appear to have been carried out without the patient's knowledge during the course of another operation, so that the effect of suggestion could to a great extent be excluded.

Levy-Lenz and Schmidt report cases of failure and also of success. In the opinion of the latter no good results may be expected when the testicle of the patient shows marked senile atrophy. This, of course, is only to be expected when it is remembered that the whole success of the operation is dependent on the power of the testis to respond by increased output of hormone to the stimulus of ligature. All observers remark on the variable latent period that occurs in positive cases before any improvement is noted. Sands states that in some of his cases the beneficial effect of ligature was delayed for as long as six months. Various explanations may be offered for this long latent period. Amongst others the fact that regression in the tubules does not immediately follow the application of the ligature.

FIG. 2. FIG. 3.

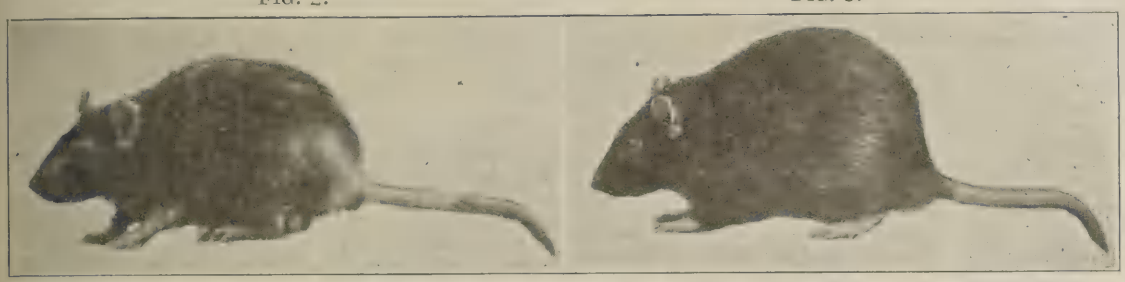

FIG. 2 shows a rat with marked signs of senility (26 months old). The emaciation, thinness of the fur, and sleepiness (eyes closed) of the animal are striking. The back, hips, upper part of the thigh, and portions of the feet are quite bald.
FIG. 3 shows a brother of the same litter, three and a half months after vaso-ligature. According to Steinach, this animal at the time of operation presented an even worse appearance than its brother (Fig. 2), so that on account of its apparently hopeless condition it was not even photographed or registered. "In spite of this complete regeneration and revival of functions took place, although after a longer latent period and more slowly than in the case of other senile animals. The animal survived the operation about ten months and its brother by eight. Three months after ligature it was a fine, strong animal with a coat completely restored, eyes that sparkled, and a youthful mien." (Photographs and descriptions kindly supplied by Prof. Steinach.)

Table showing Changes following Vaso-Ligature in Three Human Patients.

Case.	Age.	Died of—	Period elapsed since ligature.	Findings in (*a*) control testis; (*b*) ligatured testis.
1	78	Epithelioma of tongue. Cachexia.	Days. 17	Leydig cells: (*a*) Fair number; (*b*) increased. Tubules: (*a*) No spermatogenesis; (*b*) no change.
2	63	Sarcoma of jaw. Cachexia.	52	Leydig cells: (*a*) Fairly numerous; (*b*) no obvious increase in number. Tubules: (*a*) No spermatogenesis; some tubules show marked degeneration; (*b*) still greater signs of degeneration present.
3	71	Uræmia.	78	Leydig cells: (*a*) scanty; (*b*) increased in number. Tubules: (*a*) Spermatogenesis; (*b*) spermatogenesis still present; early signs of degeneration in a few tubules.

Note.—In Cases 1 and 2 there were no signs of reaction in the tubules as the result of the ligatures, and in Case 3 only very early indications of degeneration were visible. In two out of the three cases an increase of interstitial tissue had taken place.

Although numerous observations have been recorded of changes occurring in the testes of animals after ligature, no records are available of the histological changes occurring in the human subject. For this reason we took the opportunity of carrying out ligature of the vas in three cases suffering from

malignant disease and renal failure, and of examining post mortem the changes that had followed the placing of the ligature. Although the fact that the patients were suffering from severe cachexia somewhat prejudices these observations, the results obtained are sufficient to show that the time taken for marked changes to appear in the tubules of the human testis after ligature is considerable, probably two months or more.

Treatment of Paralysis Agitans by Vaso-Ligature.

Of the four patients treated by means of vaso-ligature, whose histories are given below, three were cases of paralysis agitans. The failure of every known form of treatment to alleviate this condition justified, in the writers' opinion, a trial of vasotomy. Dubief, in discussing this disease, states that "paralysis agitans has for an anatomical basis the lesions of cerebral spinal senility which differ only from those of true senility in their early onset and greater intensity." The employment of Steinach's operation, therefore, seemed particularly appropriate. Although some improvement was noted in two out of the three cases this improvement was much the most striking in the first case reported. It is true that allowances must be made in this instance for the nursing, care, and food the patient received on admission to the hospital, and that some of the improvement may be put down to these factors. However, the alteration in the patient's condition after each of the ligature operations was so marked that it is difficult to believe that it bore no relation to these proceedings. The fourth case reported was a patient in good health, who requested that bilateral ligature of the vas should be carried out for purposes of sterilisation.

CASE 1.—Patient, aged 63, admitted to St. Mary Abbots Hospital Oct. 7th, 1923, suffering from paralysis agitans.

History.—Tremors and increasing rigidity for a period of three years prior to admission. Complete loss of control of anal sphincter for two years.

Condition on Admission.—Typical mask-like expression, with general muscular rigidity and marked clonic movements of the head, trunk, and limbs (pill-rolling). Articulates only with difficulty. Patient very emaciated, completely bed-ridden, and unable even to turn in bed without assistance. A very marked stoop; when propped in a chair his body falls forward so that he has to be placed again in an upright position. Complete incontinence of fæces, the patient being conscious of desire to evacuate the bowel, but unable to wait until the bed-pan arrives. Unable to feed himself, spills fluids when trying to use a cup, and fails entirely to guide food into his mouth. Grip on both sides very poor, movements are continuous throughout the day, and the patient rests badly at night, owing to jumping in his sleep. Sexual desire decreasing for some years and completely absent for 12 months before admission.

First Operation.—On April 4th division of the right vas between ligatures. About four weeks after operation the patient began to show signs of improvement, the first manifestation being an improvement in articulation. Muscular rigidity and tremors diminished so that he was able to balance himself on his feet and to walk, but with some difficulty. However, he still found it impossible to turn round without support. Control of the sphincters was also regained, and the weight and appetite increased. The improvement continued so that he became able to feed himself with slight difficulty. The tendency to fall forward when sitting in a chair diminished, and the clonic movements disappeared entirely with the exception of those of the hands; even these were reduced in severity. Associated with the improvement in the physical condition was a more cheerful mental state and greater tranquillity at night.

Second Operation.—Owing to the patient's improvement as the result of the previous operation, there was no difficulty in obtaining his permission to carry out a similar proceeding on the opposite side. This was accordingly carried out on August 31st. Four weeks after the second operation sexual desire returned, accompanied by daily erection. The patient now stands almost straight, walks up and down stairs with ease, turns round unaided, and moves in bed without assistance. He feeds himself without difficulty, and his appetite has increased still further. There is a marked diminution in the mask-like expression, a change that has been commented on by several relations. He sleeps very well, retains complete control of his sphincter, and the movements have disappeared except for some pill rolling that returns when the patient is excited. There is still some rigidity of the muscles. The grip is good for a man of hi age. On Jan. 12th it was noted: "sexual desire still main tained. General condition still remains good; there i little new to add since the last note."

CASE 2.—Patient, aged 55, admitted to hospital o July 24th, 1923, suffering from paralysis agitans.

Condition on Admission.—Weakness of right arm and leg the grip being poor on that side, and the leg dragged whe walking. Right leg slightly flexed. Rigidity and marke clonic movements of right hand and arm continuous through out day. Owing to weakness on right side is unable to hol a cup. Typical mask-like expression.

Operation.—Unilateral vasotomy was performed on th 27th.

Subsequent History.—On Jan. 12th, 1924, there is diminution in the tremors of the right arm, which are no only marked during excitement. No improvement in th condition of the right leg, or in the grip; no alteration i mask-like expression. The patient's general conditio would appear to have improved, and the tremors to hav diminished, but the effect has been much less than tha observed in Case 1.

CASE 3.—Patient, aged 50: in 1917, when in command a battalion in France, noted twitchings of the right hand which gradually increased in intensity and afterward affected the right foot, so that in walking he failed to cle the ground with his heel. In 1918 a diagnosis of paralys agitans was made. In spite of his illness he remained hard at work on home service, and in 1920 began to suffe considerably from nocturnal emissions, which left him t following day with an intense headache and a feeling depression. It was for these emissions in particular tha he consulted me, and at Dr. C. B. Heald's suggestion I agree to try the effect of vasotomy.

First Operation.—Ligature of right vas, Dec. 19th, 192 Subsequent to the operation emissions diminished very muc in frequency as also did the headaches.

Second Operation.—Ligature of left vas, May 19th, 192 Following this operation the emissions practically di appeared, and the patient no longer suffered from headache He still remained at work, but under great difficulties, an with a steady progression of the signs of muscular weakne and tremor. Although the operation had cured the conditi for which the patient sought relief, it appeared to have ha little or no influence on the general progress of his disease.

CASE 4.—Patient, aged 63, in good health, but operat on at his own request with a view to sterilisation.

Operation. Bilateral division of the vas betwee ligatures, June 6th, 1923.

Subsequent History.—In order to avoid the effect mental suggestion, little was said concerning the possibili of the operation having a beneficial effect on the gener health. The patient was requested to write and furnish a unbiased statement of his general health some 5 mont afterwards. The following is the letter received: "I a glad to tell you that I am quite well in health, and fe younger and more sprightly than for years. I am not s nervous, my sight has improved, and my sciatica has gon Whether all these benefits are due to the operation I cann say for certain, but I think so."

Conclusions.

At the present time there is insufficient materi on which to base a decision as to the value of vas ligature as a means of treatment in man. The result of the operation appear to have been capricio although numerous cases are reported in whi benefits accrued. As, however, the data on whi the claims of improvement rest are inexact an incapable of measurement, a large number of observa tions will be necessary before it will be possible bring in a final verdict as to the precise value of th form of treatment. However, whatever the verdi concerning this clinical problem may be the resul obtained by Steinach in his animal experiment a certainly of the greatest biological interest.

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A CONSIDERATION OF THE AFTER-RESULTS OF THE ABDOMINAL OPERATION FOR RETROVERSION.

WITH NOTES OF FIFTY CASES.

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MUCH discussion has recently arisen as to the clinical significance and necessity for operative treatment in cases of retroversion, and it has appeared to me that a useful purpose might be served by recording a series of cases showing the results of 50 abdominal operations for this condition. Retroversion is a condition of great frequency, Schroeder[1] finding it in 25 per cent. of medical cases, with no pelvic symptoms, while L. J. Stacey[2] found the uterus retroverted in 202 out of 11,000 single women examined, between the ages of 15 and 45. Its clinical significance, and therefore the necessity for and method of treatment, is, however, very variously estimated.

Previous Views of the Subject.

Looking through the literature on the subject, I have been struck by the fact that practically all writers include cases of prolapse when recording the after-results of their operations for retroversion. This seems to me to introduce an element of doubt into statistics, and to falsify the latter. In considering both the symptomatology and treatment of retroversion a definite distinction should, I think, be made between cases of retroversion associated with descensus of the pelvic viscera and weakness of the pelvic floor and cases in which no such condition is present. Possibly it is the inclusion of the former, when considering the symptomatology, &c., of retroversion that has led to such divergent opinions being held about the condition. These cases should, I think, always be included under the heading "prolapsus," as they are simply part of the mechanism in the production of this condition, and differ from the second group of cases mentioned above in that they usually give rise to a fairly definite train of symptoms—curable, as a rule, by treatment, which is always required when the condition is in the least marked.

Cases falling into the second category—only these cases, with one minor exception, are included in this paper—include those in virgins, in multiparæ, and others, where no evidence of prolapsus is present clinically, although I am aware that in this last group very slight degrees of pelvic descensus cannot always be absolutely excluded. The significance of retroversion in these cases is very difficult to estimate, and many symptoms (e.g., menorrhagia, pain in the back, sterility, &c.) which have in the past been ascribed to it can be explained by associated conditions occurring either intra- or extra-pelvically. With the possible exception of rare cases of sterility due to mechanical difficulty (Giles) and cases included under the "Bonney" syndrome, retroversion itself probably never causes a definite symptomatology, and may, I think, be looked on, when causing symptoms, as an accidental finding associated with other pelvic disorders—e.g., gross pelvic disease such as tubal inflammation, or less obvious pathological conditions such as underdevelopment of the uterus and ovaries.

I cannot, however, agree with Palmer Findlay[1] when he states that retroversion is of no clinical significance, with the possible exception of sterility, save as a step to prolapse; with A. W. Collins,[3] I would rather regard the condition, in acquired cases, as rendering the uterus more liable to disease, exaggerating minor pathological conditions which may be present, and by torsion of the pampiniform veins giving rise to an unhealthy condition of the ovaries, which are frequently prolapsed with the fundus and very tender. In the so-called "congenital" cases any existing symptoms are probably due to associated errors of development—e.g., the posterior cochleate uterus (Blair Bell), stenosis of the cervix, &c.

The era is past of those gynæcologists who considered that retroversion as a uterine displacement was a condition of marked clinical importance always requiring treatment; but this idea, I am sure, is not entirely eradicated from the lay mind, and possibly gives rise to the marked neurotic element in certain cases. The idea is clearly expressed by Palmer Findlay[1]: "For generations women have been led to believe that displacements of the uterus gave rise to all manner of local and general symptoms, and now, when informed by a physician that the 'womb is out of place' they are disposed to rationalise all complaints on the basis of the displacement. Have we not all observed cases in which retroversion gives rise to no pelvic disorder until, through suggestions, the displaced uterus becomes a pain-pathway for neurosis in a woman who has acquired nervous instability from overstress?"

That operative treatment in the past has not always been satisfactory is shown by the numerous operations—I believe they number more than a hundred—which have been devised for the cure of the condition. It is my object here not to extol any one of these or to suggest another, but rather to attempt to estimate the benefit obtained, if any, from some simple abdominal operations, as distinct from the plastic vaginal operations commonly performed. Two varieties of "sling" operation—viz., Kelly's modification of Gilliam, and Mayo's internal Alexander—and a simple method of shortening the round ligaments have been used in the series I am about to describe.

Details of the Cases under Consideration.

The cases in my series were all operated on in hospital between the years 1916 and 1921 inclusive. Their clinical histories were obtained from hospital records, while information as to their present conditions was elicited by means of a written questionnaire of the following nature:—

1. Are you cured by the operation? If not,
2. Were you relieved by the operation, and if so, how long did this relief last?
3. Do you complain of anything now?
4. Have you had a child since?
5. Have you had a miscarriage since?

A request to attend hospital for examination was appended, and over 90 cases were addressed. Answers were obtained from 50; these cases only are included in the series.

State, Age, and Multiparity.—Six of the patients were single; 44 were married, of whom 18 were sterile, including 2 who had had miscarriages only; 26 had borne children. Their ages, in periods of five years, were as follows: Aged 20–25, 6; aged 25–30, 12; aged 30–35, 18; aged 35–40, 8; aged 40–45, 4 aged 45–50, 2.

Symptoms.—The subjective symptoms were as follows, and were rarely single, two or more being usually complained of by the same patient. The duration of symptoms was difficult to estimate, many patients stating that they had "always" had their "trouble," but it appeared to vary between three months and three years. Complaint was made as follows:—

Symptom.	Cases.
Menorrhagia	25
Dysmenorrhœa	21
Constant pain (back or side)	41
Sterility	18
Dyspareunia	3

Operations Performed.

In 19 cases intraperitoneal shortening of the round ligaments was performed, the round ligaments being folded on themselves for half an inch sufficient to render the ligaments tense and hold the fundus

forward in the anteverted position. In the remaining 31 cases sling operations were performed, 10 by Mayo's internal Alexander method, loops of round ligament being withdrawn through the peritoneum opposite the internal abdominal ring, and stitched to the anterior rectus sheath; and 21 by Kelly's modified Gilliam method, loops of round ligament being withdrawn through peritoneum and rectus muscle and joined together beneath the fascia.

In this series of cases other pelvic complications were found in 31, or 62 per cent., of the cases, multiple lesions being present in many instances. They were as follows:—

Symptom.	Cases.
Chronic appendicitis	4
Cystic ovaries	10
Tubal occlusion or inflammation	3
Pelvic or peritubal adhesions	12
Prolapsed cæcum or colon	3
Uterine fibroids	3
T.B. iliac glands	1
Hypertrophied cervix	1

This is a lower percentage of complications than is given by most writers; Palmer Findlay,[1] for example, finds in his series of 480 cases only 20, or 4 per cent., uncomplicated. The difference is due, I think, to my having excluded cases of prolapse as far as possible.

After-results of Operation.

Answers were obtained from 50 patients, of whom 27 attended at hospital for examination and 23 sent written replies only. Ten (or 20 per cent.) expressed themselves as cured, 26 (or 52 per cent.) as relieved, 14 (or 28 per cent.) remained in statu quo. I have labelled cases "cured" when the patients so described themselves or no longer complained of any symptom referable to the pelvis. Where sterility was the only symptom at the time of operation I have not considered the patient cured unless she has since conceived; but where sterility is complained of among several other symptoms, and these other symptoms have all been cured, I have called the case cured.

Information as to relief of individual symptoms has been difficult to obtain, but the following are noted:—

Cases.	Symptom complained of.	Relief obtained in—
25	Menorrhagia	11
21	Dysmenorrhœa	16
41	Constant pain	27
18	Sterility	4
3	Dyspareunia	1

Of the 10 cases who were "cured," complications were present in 8 cases at operation—i.e., 80 per cent. In 26 cases who were only relieved, complications were present in 21, or approximately 80 per cent.; while in the 14 cases who remained in statu quo only 71 per cent. had complications.

Position of Uterus.—In the 27 cases who reported for examination the uterus was found anteverted in 22 cases, of whom 12, or 55 per cent., were relieved, and retroverted in 5 cases, of whom 3, or 60 per cent., were relieved.

Pregnancy had occurred in 8 of the 50 cases, of whom 1 was pregnant at the time of investigation and 2 had had miscarriages only. Of these 8 cases, 6 expressed themselves relieved, while of 4 cases who presented themselves for examination, the uterus was found anteverted in all.

In comparing these results with those of other authors, the difficulty previously alluded to arises—namely, that practically all either include cases of prolapse or leave one in doubt as to whether prolapse is included or not.

In 1899 Alexander[4] published a list of 69 cases operated on by his method of external shortening of the round ligament. In practically all cases a pessary, either a Hodge or a Hodge and stem, was inserted at the time of operation, and nine cases required operation for prolapse. He reports on cases at intervals from six months up to ten years after operation and finds the uterus in good position in 46 cases and the symptoms relieved or cured in 36 cases. Pregnancies had followed in 18 cases, of whom 13 remained well, and among whom the uterus was found anteverted in all but 3 cases. A series of cases published by A. Goldspohn[5] is also interesting; of 127 cases treated by a modified Gilliam operation (perineal operations were also required in 23·5 per cent. of cases) health and position of uterus remained good in 88 per cent. of cases. In 1·6 per cent. of cases there was a recurrence of displacement.

Comparing the above series of results with those obtained by pessary treatment I note that F. W. Lynch[6] in a series of 281 cases found a pessary useless in 47 (a pessary could not be retained in 32 cases), but in the remainder obtained a 72 per cent. cure. These results appear much more satisfactory than those recorded in my series, but I recapitulate that I consider this due to the inclusion in their series of well-marked cases of prolapse.

Conclusion and Summary.

1. Cases of retroversion complicating prolapse should be treated as cases of prolapse. Abdominal operation alone rarely, if ever, cures these cases, and their inclusion in statistics of operations for retroversion leads to confusion.

2. Retroversion is not a disease in itself and never, with the possible exception of the "Bonney syndrome," gives rise to a definite train of symptoms. It is usually complicated by other pathological findings; and it is these, as a rule, which indicate operative treatment, and upon which relief of symptoms largely depends. In this series, 80 per cent. of "cure" cases were complicated, while only 70 per cent. of cases unrelieved had complications. Possibly a longer series might show a more marked difference between these two. In cases where no complication is found on clinical examination, and sterility is complained of, operation is sometimes indicated, as closed tubes may be present and a better chance of conception seems to be given after dilatation of the cervix, if the uterus is replaced and retained in the anteverted position.

3. In many cases an undoubted nervous element is present, the significance of which must be carefully assessed before operative treatment is undertaken, and in considering the result of such treatment.

4. Too few cases of pregnancy have occurred in my own series to enable one to make any statement as to its effect, but from a consideration of the results given by other authors, pregnancy does not seem to exert any deleterious effect on orthopædic and clinical results of treatment beyond the fact that it makes prolapsus more common and may, if symptoms recur, transfer the case to one of the first category mentioned in this paper.

All cases mentioned in this paper were patients at the Hospital for Women, Soho-square, and I desire to express my thanks to members of the honorary staff for allowing me to make use of notes, &c.

References.

1. Schroeder, quoted by Palmer Findlay: Jour. Amer. Med. Assoc., Sept. 2nd, 1922, pp. 795–797.
2. Stacey, L. J.: Jour. Amer. Med. Assoc., Sept. 2nd, 1922, pp. 793–794.
3. Collins, A. W.: Med. Record, Oct. 8th, 1921, p. 621.
4. Alexander, W.: Practical Gynecology, Neil, Edinburgh, 1899.
5. Goldspohn, A.: Amer. Jour. of Obstet., Nov. 18th, 1918, p. 688.
6. Lynch, F. W.: Amer. Jour. Obstet. and Gynecology, Oct. 1922, pp. 362–371.

PEOPLE'S LEAGUE OF HEALTH.—The next course of the Sims Woodhead series of ten weekly lectures, followed by an examination (not compulsory), and Travelling Scholarship Prize awards, will be given at the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., beginning on Feb. 11th, at 6 P.M. The lectures will be delivered by Dr. H. A. Harris, Prof. M. S. Pembrey, Sir Frederick Mott, F.R.S., Sir Harry Baldwin, Prof. J. C. Drummond, Dr. J. Mellanby, Sir William Arbuthnot Lane, Prof. H. R. Kenwood, Mr. E. B. Turner, and Dr. A. F. Tredgold. Further particulars may be obtained from the hon. organiser of the League, 12, Stratford-place, London, W. 1.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF COMPARATIVE MEDICINE.

DISEASES OF NUTRITION IN ANIMALS.

A MEETING of this section was held on Jan. 23rd, Sir LEONARD ROGERS presiding.

Prof. E. MELLANBY pointed out that in recent years our views on nutrition had greatly changed. It was now known that substances formerly regarded as physiological units had great biological differences—for example, different proteins, and, moreover, dietetics had been altered by the discovery of vitamins. The deficiency diseases—scurvy, beri-beri, and rickets—could all occur in the animal as well as in the human world. Scurvy had been described in hogs and occasionally in dogs. Veterinary text-books consulted by Prof. Mellanby recommended the addition of grain, acorns, and horse-chestnuts to the diet of hogs thus affected; these substances were not strongly antiscorbutic. Beri-beri was sometimes to be seen in domestic animals, such as birds, and was easily cured. He intended to discuss chiefly the conditions which in animals tend to produce good and bad bones. Actual rickets did not indeed often appear spontaneously in animals except dogs, but while bone changes might not be produced, the lowered vitality and changes in muscle resulting from bad feeding might well be of economic importance in other animals. There were some grounds for assuming that the results of his experimental work, which had been done on dogs, might apply to other animals, even herbivorous ones, in that green food, such as lucerne and clover, here supplied the necessary accessory factor.

The Toxic Effect of Cereals.

One of the commonest dietetic mistakes was to feed animals with cereals—for example, oats or bran. Prof. Mellanby demonstrated slides showing that dogs fed on a diet deficient in vitamin A, leading to rickets, got worse when fed on cereals, white flour being least toxic, and next in order being rice and rye; oatmeal and wheat-germ were specially liable to intensify the rickety condition. The toxic factor could be associated neither with the calcium-phosphorus ratio in the foodstuff, the salt content, the carbohydrate present, nor the nucleic acid; its nature was still undiscovered, and it could only be said at this stage that something in cereals was toxic and interfered with the process of calcification. The antagonists to this unknown factor included (1) calcium (carbonate being better than phosphate); (2) ultra-violet light when the diet was not excessibly deficient; (3) cod-liver oil, of which $\frac{3}{4}$ daily counteracted the detrimental effect even of oatmeal. Prof. Mellanby showed slides not only of bone but of teeth and of muscle, to show the damage that could be done by a cereal diet. The first result of such a diet was lethargy, which might go on to paralysis; it was easy to produce any intermediate stage by varying the diet. He suggested that in animals put out to graze the rest was not so important in their cure as the plentiful green pasture available. Incidentally the diet generally given to racehorses in training was puzzling, as on theoretical grounds it seemed unlikely to produce fast runners.

Whether his results applied to animals other than dogs Prof. Mellanby could not state definitely, but the evidence that they did apply to children was convincing. The points that required emphasis from the veterinary standpoint were: (1) That the foodstuffs in general use had a toxic effect; this was no reason for not using them, but the fact should be realised and antagonists suitable for different animals—lucerne, cabbage, milk, fish fats—should be added. (2) That calcium carbonate was a serviceable antagonist. (3) That freedom in fields, which implied greenstuffs and sunlight, was of benefit. Animals kept in confinement and fed on oats or oatmeal or wheat-germ were in some danger. Progressive agriculturists who gave their stock wheat-germ because it contained vitamin B and some vitamin A must remember that it contained also something of a toxic nature.

The Development of the Science of Dietetics.

Miss HARRIETTE CHICK, D.Sc., traced the history of the newer dietetics during the last ten years, showing how the parallel between polyneuritis of birds and beri-beri, and that between scurvy in guinea-pigs and in humans, and rickets in dogs and in humans, pointed to the conclusion that many of the results of experimental work did apply to the whole race of mammals and sometimes to birds also. Work done piecemeal at different places and times appeared to be coalescing slowly into a coherent intelligible whole. Quite recently American investigations on poultry had shown that on a diet deficient in vitamin A, leg weakness and a diseased condition of the eye similar to that seen in the rat and rarely in infants occurred in fowls, and the interaction of light and diet, proved on children in Vienna, had also found a complete parallel in these animals. The only animal which still appeared anomalous in this respect was the pig, but Miss Chick expressed the hope that ultimately even the pig would be brought to heel! As an instance of a striking anomaly that had been explained by further research, Miss Chick recalled the disconcerting failure to cure guinea-pigs of scurvy with lime-juice, and its explanation by the history of the change of nomenclature of lime-juice and lemon-juice.

The Veterinary Point of View.

Mr. HENRY GRAY said that no practical man would ever think of feeding dogs on the food Prof. Mellanby had used in these experiments. Rickets could be induced in dogs, especially in large breeds, if they were kept on a chain and given no exercise. Practical agriculturists fed their animals on the food produced on farms, guided by tradition handed down and modified by their own experience. Osteomalacia could occur in animals exposed to sun and given green food; it appeared sometimes to be dependent on the change of food natural to a special race. For example, horses accompanying the French army to Cochin China developed osteomalacia, and fodder had to be imported for them from Europe and Algeria. He considered heredity to be a factor in bone disease, and also overwork. He had seen rickets develop in dogs kept without exercise in sunlight, and had seen horses in good condition after 20 years in coal-mines. Certain breeds of toy spaniels were liable to mal-development of bone, also bulldogs, in which teeth were sometimes set in cartilage; this seemed to be a heredity defect. Lack of muscular power in shire horses was the result of over-forcing and lack of exercise. Mr. Gray concluded, after studying Prof. Mellanby's interesting conclusions, that "his theory was not applicable to our practice."

Polyneuritis and Beri-beri.

Colonel R. MCCARRISON wished to dissent from the general impression that polyneuritis of birds was identical with beri-beri. In man suffering from beri-beri cardiac enlargement was a prominent feature, while in experimental birds with polyneuritis atrophy of the heart was found. He had produced polyneuritis some 2000 times, and not until among the last 200 pigeons had he met with true beri-beri—with enlarged heart, pericarditis, and so forth. This batch of pigeons came from Bangalore, and five or six out of the 200 were affected. As regards beri-beri in man, in 1917 two battalions of the same regiment were quartered at Quetta and fed from different sources. Of the 800 fed on rice 3·5 per cent. developed beri-beri—approximately the same percentage as of the pigeons. Colonel McCarrison expressed his conviction that something more than the absence of vitamin B was necessary for the production of true beri-beri in birds—some factor with a

specific action on the heart. In India, where rice was cultivated everywhere, of the 595 cases occurring in the Indian army between 1900 and 1914, 500 occurred in an area in the north-east, where beri-beri is endemic. It would seem that residence in a certain locality imparts some stigma to individuals which makes them more liable to succumb to bad dietary conditions. With regard to muscle, if the changes shown by Prof. Mellanby in skeletal muscle took place, muscles of gastro-intestinal tract were probably even more affected by deficient diets and faulty feeding might well account for the large amount of chronic gastro-intestinal disease now so common. As to the importance of faulty feeding in resistance to infection, Colonel McCarrison quoted his experiments on monkey carriers of *Entamœba histolytica*—those only who were badly fed developing dysentery.

Prof. G. H. WOOLDRIDGE pointed out that in animal dietetics the economic aspect often overshadowed the medical one, even in standard text-books. He emphasised the need of balance as well as vitamins in food. Affections allied to rickets occurring later in life had been studied. Sir Arnold Theiler in South Africa showed that cattle with depraved appetites who ate bones of carcasses left on the veldt acquired a bone disease; this was partly due to infection by bacteria, since when these bones were sterilised and the animals induced to eat them no bad effects resulted.

Dr. M. J. ROWLANDS confirmed Prof. Mellanby's remarks as to the toxic effect of wheat-germ from practical experience. On theoretical grounds he had tried to feed pigs with wheat-germ as a source of vitamins A and B; 20 large white sows had been given wheat-germ, supplemented by meat and fat; all had developed violent diarrhœa. Ten had been put on middlings and recovered, and the 10 controls left on the old diet had died. He agreed with Mr. Gray that the diet used by Prof. Mellanby was unsuitable for ordinary dogs, but of the importance of the effect of vitamins on animal nutrition he was convinced by the happy practical results of their administration.

Captain KIRK asked whether the question of disturbed internal secretions as a factor in rickets had been considered by Prof. Mellanby. He asked whether any light could be thrown on the fact that if the rations of hard-working horses were not reduced during a period of rest they were liable to develop acetonuria.

Dr. F. W. COLLINGWOOD said that pigs had been reared successfully on nothing but swedes, with no meat at all.

Prof. F. HOBDAY confirmed the fact that osteomalacia appeared to be endemic. In veterinary experience crude cod-liver oil seemed to give better results than the purified form, and calcium lactate appeared to be the most useful form for administering calcium.

Captain F. C. GILLARD suggested bowel parasites as a contributory factor in rickets.

Dr. J. S. EDKINS pointed out that cats were specially liable to parasites, but did not suffer from rickets.

Reply.

Prof. MELLANBY, in reply, explained that theories such as those of hormones and bowel parasites as factors in rickets appeared to be merely hypotheses with no evidence to support them, whereas experimental evidence, though it might not be conclusive, represented at least an attempt to pick out the more important factors in the production of this disease.

SECTION OF PATHOLOGY.

A MEETING of this section was held on Jan. 15th, Prof. J. G. LEDINGHAM, F.R.S., the President, being in the chair.

Dr. J. KILIAN CLARKE contributed a paper on the

Bacteriology of Dental Caries.

He said that all the very meagre evidence at our disposal tended to support Miller's theory that dental caries is due to bacterial fermentation of carbohydrates with production of acid which decalcifies the teeth. Of late considerable attention had been directed to the acidophile group of bacilli in this connexion; the members of this group were active producers of acid, in a high concentration of which they could live—in fact, they grew best in a medium of a comparatively high acidity. McIntosh, James, and Lazarus-Barlow isolated acidophile bacilli from 44 out of 50 carious teeth examined by them, and produced lesions resembling caries in healthy teeth placed in glucose broth cultures. The teeth examined by these observers and others were in a fairly late stage of caries, with cavity formation, and the conditions in these cases are very different from those which obtain at the initiation of the lesions. Dr. Clarke was unable to isolate acidophile bacilli from early cases in which there was little or no apparent loss of enamel substance, but found another organism constantly present; this organism does not appear to have been described previously, and he proposed the name *Streptococcus mutans* for it. *S. mutans* is a streptococcus on media of a neutral reaction, but grows as a bacillus if the reaction becomes acid. It is Gram-positive, aerobic, and facultatively anaerobic. The colonies are very coherent and difficult to pick up off the surface of the medium, as they run along in front of the needle. It is an active producer of acid, but is not acidophile, as it is quickly killed if the medium becomes acid, and refuses to grow on a medium with a reaction more acid than pH 5·6. All strains isolated are identical in fermentation and agglutination reactions. *S. mutans* was isolated from 36 out of a series of 50 teeth (in pure culture from eight), while in most of the negative cases colonies of the organism were seen, although it could not be isolated. The lesions in these teeth were, in the great majority of cases, very early. Acidophile bacilli were isolated only in the more advanced cases, where there was a break in the continuity of the enamel, or in cases in which the lesions were very shallow and the surface encroached on in taking the specimens. Attempts to produce artificial caries in healthy teeth, by placing them in cultures of *S. mutans*, were being made. The growth of the organism adhered markedly to the surface of the teeth and decalcification of the enamel took place with comparative rapidity. Decalcified sections of a tooth kept in cultures for nine and a half weeks were exhibited; they showed the organisms, which had penetrated the enamel, invading the dentinal tubules. The medium had been changed daily, so that the tooth did not remain for any length of time in an acid solution; in McIntosh, James, and Lazarus-Barlow's experiments the medium was changed only once a week. Although there was as yet no conclusive evidence to prove that *S. mutans* was the cause of caries, the facts that it was found regularly in early cases, sometimes in pure culture, grew best at a reaction approximating that of the saliva, adhered to the surface of the enamel, and could produce lesions in vitro similar to those of caries were, to say the least, suggestive.

Mr. ROBERT T. GUNTHER demonstrated a case of

Arterio-sclerosis in a Crocodile of the Mesozoic Age.

He exhibited vertebræ of fossil crocodiles from the mesozoic strata of Oxfordshire which showed coloured Y-shaped markings following the course of segmentally arranged intercostal arteries and veins. The suggestion receives confirmation from the subsequent finding of such arteries in a recent crocodile and from the discovery of lateral grooving of similar vertebræ in a crocodile from an older geological stratum. That the imprints of these arteries, whether in colour or as grooves, had not been previously observed, is due to the great scarcity of specimens exhibiting them, and as by far the greater number of crocodilian vertebræ did not show them Mr. Gunther is inclined to regard them as pathological, and possibly as indicating an early stage of arterio-sclerosis.

Mr. ALEXANDER FLEMING read a paper on

Accuracy of Measurements with Capillary Pipettes.

He described the various types of error which might occur and showed that when the "wash,"

that is, the fluid which remains adherent to the pipette, is eliminated a volume of fluid as small as 5 c.mm. can be measured from a capillary pipette with great accuracy. The "wash," which is the greatest error in measurement with capillary pipettes graduated in the ordinary way with a measured volume of mercury, is almost constant when the fluid is expelled from the tube at anything approaching the same rate of speed, and with pipettes such as are in common use it amounts to about 3 per cent. of the total volume. The "wash" provides a progressive error in making a series of two-fold dilutions such that at the eighth dilution the error will amount to about 13 per cent. The author described a pipette graduated in such a manner that a series of dilutions in arithmetical or geometrical progression could rapidly be made with accuracy and the error due to the "wash" eliminated.

SECTION OF OPHTHALMOLOGY.

A MEETING of this section was held on Jan. 11th under the presidency of Mr. A. L. WHITEHEAD.

Lieut.-Colonel H. HERBERT read a paper on a case of

Late Chronic Sympathetic Ophthalmia.

He said the disease followed a trephining operation, performed without iridectomy, for congestive glaucoma, in November, 1917, when the patient was 62 years of age. More than five years elapsed before the other eye became involved. The operation did not entirely relieve the tension, and the congestion persisted for more than a month. After that it gave no more trouble until the fellow eye was attacked, and then injection and tenderness returned. In the sympathising eye the disease was comparatively mild, and seemed to yield completely to three months of simple mercurial treatment. In this case there was ample histological evidence that the operated eye, during the five quiet years, was only relatively quiet. The notes mentioned only a dense white pupillary opacity and the fact that the eye was blind. There was good reason for believing the eye was the seat of a very feebly progressive infective process throughout. The nodular character of the uveitis was very noticeable, the foci of greatest infiltration standing out as round white points in the iris, ciliary body, and choroid. Colonel Herbert described the cytology by means of a number of slides. As a probable indication that the unknown specific organism had become acclimatised outside the uvea, large-celled infiltration could be followed through the tissues filling the trephine hole and through the sclera, along the anterior perforating blood-vessels above and below the cornea. It had spread into the conjunctiva, and backwards immediately superficial to the sclera. There was another extra-uveal site of activity beneath the thick pupillary membrane noticed clinically between the membrane and a thick capsular cataract. The detached retina was folded and thickened, and the ciliary body and choroid were more or less detached from the sclera, and their layers were widely separated. The inner surface of the choroid below merged into a thick layer of new fibrous tissue, containing masses of pigment granules, derived possibly from the retinal pigment layer; pigment had also wandered into the detached retina.

With regard to the bearing of the case on the operative treatment of glaucoma, he had not heard of any instance of the disease following an intentional iris-inclusion operation for over 20 years, and he believed a correctly performed iris-inclusion operation was quite free from this risk; but he held that correct performance included effective conjunctival antisepsis. In the present case the trouble was probably due to the lack of this.

Discussion.

The PRESIDENT said that most of those who habitually did the trephine operation would join issue with Colonel Herbert's contention that in most cases there was incarceration of the iris.

Mr. R. PICKARD spoke of a case he had three years ago which might have been one of sympathetic infiltration after trephining. The operated eye did not do well, and about six weeks later keratitis punctata developed in the fellow eye. He promptly removed the first eye, and the other recovered. He had had two or three cases of chronic glaucoma affecting both eyes, in which suddenly, for no apparent reason, one eye developed severe irido-cyclitis, leading to blindness. It looked very much like sympathetic ophthalmia. He thought that in some cases chronic glaucoma was the expression of some very mild cyclitis without the ordinary symptoms of cyclitis. Yet it might be seen when there had been no operation on the other eye.

Sir WILLIAM LISTER said that in doing the trephining operation it was very important to see that no iris whatever was incarcerated. He believed that the cases of late infection which had occurred were those associated with some entanglement of iris in the wound. This avoidance of incarceration of iris should be aimed at by three procedures. Directly the knuckle of iris appeared through the trephine hole, the posterior portion should be pulled up so as to do irido-dialysis, and pull out sufficient iris, so that when the iris was cut it spread away from the opening. Where there was a large pupil one should aim at doing a complete iridectomy right through to the pupillary margin.

Mr. R. A. GREEVES said that sometimes the trephine was put on too far back, resulting in incarceration of the iris. He had cut sections of a series of eyes which had been trephined and were failures, in each case because of iris incarceration, and in all of them he considered the trephine had been put too far back and the cornea had not been split far enough forward.

Mr. R. L. REA spoke of a case in which he had to trephine two eyes in an urgent case of glaucoma. In one case the iris became incarcerated round the edge of the trephine hole and he could not free it. Therefore as soon as the flap was replaced he put atropine in the eye, and kept it under the influence of that drug. It drained very well, and he saw the iris pull away completely in a fortnight. The eye had now done well, and vision was restored to 6/9 partly.

The PRESIDENT agreed with Sir William Lister as to the importance of securing freedom of the iris from the wound. He would do complete iridectomy rather than leave the slightest trace of iris in the trephine opening.

Colonel HERBERT, in reply, agreed that the small incarceration of iris had a good deal to do with the disease in this case. There was no doubt in his mind that it was a case of sympathetic ophthalmia. The histology was characteristic: there was nodular uveitis, and it was different from the tuberculous or syphilitic case.

Mr. T. HARRISON BUTLER read a paper on the

Practical Value of the Slit-Lamp,

and demonstrated the lamp. He said many still had the idea that the slit-lamp was useful chiefly for research, but such was not the case. It enabled problems connected with the ocular fundus and the media to be studied afresh, not only by greatly increased magnification, but by permitting the illumination of structures from behind, and enabling the anatomy of the eye to be seen in optical section. By means of a 40-candle half-watt gas-filled lamp a ray of light could be directed into the eye and the cornea could be seen to be illuminated, the anterior chamber dark, and in lens sclerosis there were seen in the lens dissociation areas. By lens light one could see holes and atrophic areas in the iris collarette. Also, the circulation in the vessels at the limbus in the normal eye could be seen. During the four months he had worked with the lamp, he had learned much about the anatomy and pathology of the exterior segment of the eye. The examination must be made in complete darkness, and the more difficult

objects could be seen only when the eye was dark-adapted. The examination of patients with the lamp caused them little or no discomfort. Cases of interstitial keratitis were unsuitable for examination by this means. The slit-lamp did not supersede present methods, but amplified and supplemented them. The depth to which foreign bodies had penetrated the cornea could be correctly estimated by using the lamp, and means for removal could be taken accordingly. It was of especial value in inflammatory conditions of the cornea. Deposits of cells on the endothelium in keratitis punctata could be detected when the particles were too small to be seen with the naked eye. A case of interstitial keratitis could not be completely interpreted without the slit-lamp. Observation of the aqueous was very difficult, and called for complete dark adaptation. The presence of cells in the aqueous was the first sign of irido-cyclitis, and was especially valuable in the case of a sympathising eye; such cells when seen could be regarded as an early warning of the onset of sympathetic ophthalmitis. The slit-lamp was of most service in examining the lens. The optical section given by the narrow ribbon of light enabled the lens to be seen in profile. Vogt had differentiated as lens regions the capsule, the cortex, the senile nucleus, and the embryonic nucleus. Clinically, the lens could be regarded as three lenses, one within the other, and these gave mirror effects to focal illumination. In a case of diabetic cataract Mr. Butler noted that the lens capsule was greatly thickened, and in such a case, if it came to operation, he would use capsule forceps in preference to a capsulotome. He showed four photographs illustrating a case of combined cortical cataract and nuclear sclerosis. Examination of the lens in mirror light showed that the whole surface was covered with nipple-like eminences. One of the chief uses of the slit-lamp was the power it gave to recognise slight signs of cyclitis. The chief drawback to its use was the extra time required for examination, some 50 per cent. longer than for the older method. The new means of examination was so important and specialised that the formation of a small society of slit-lamp enthusiasts was justifiable, to meet and discuss cases and problems and for mutual education.

Mr. BASIL GRAVES spoke of the many clinical features which were revealed by the slit-lamp, and the fact that it enabled the observer to detect prodromal manifestations of sympathising ophthalmitis at a far earlier stage than had been possible before its introduction. An apparently normal senile eye stood revealed by this instrument as a veritable museum; and its use in the case of patients known to be suffering from some regional affection was very fruitful of results. It was a remarkable instrument for conducting research into eye conditions, and he mentioned a number of respects in which this was the case, and the precautions which needed to be observed. But it should only bear its due and proportional share in the scheme of routine clinical examination.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

Exhibition of Cases and Specimens.

A MEETING of this section was held on Jan 25th, with Mr. R. H. ANGLIN WHITELOCK, the President, in the chair.

Dr. GEOFFREY EVANS showed a case of

Interstitial Nephritis Simulating Diabetes Insipidus

in a girl aged 13. The child's health had been good until four years ago, when thirst, polyuria, and loss of weight began. On account of these symptoms a diagnosis of diabetes insipidus had been made at two general hospitals, but the diagnosis of interstitial nephritis was established after her admission to St. Bartholomew's Hospital by the low specific gravity of the urine and the presence in it of red and white blood cells and a trace of albumin, and by the deficient urea secretion and the high blood-urea content. Cases of interstitial nephritis in children were of two types: (1) where the renal condition was a part of a diffuse hyperplastic sclerosis; and (2) where the only changes were in the kidneys. He thought this case was of the latter type and probably had a congenital kidney defect (possibly only one kidney).

Dr. C. WORSTER-DROUGHT exhibited a case of

Juvenile Tabes Dorsalis

in a girl of 10 years, with a case of Friedreich's ataxy for comparison. Tabes dorsalis was very rare in childhood. In 1903 Marburg collected the records of 34 cases but some of these were doubtful, as the difference between this disease and Friedreich's ataxy was not always appreciated by the earlier observers. In the juvenile form of tabes the pupillary signs were the first to appear and might be followed by optic atrophy; lightning pains and visceral crises were less common than in the adult form, and ataxy was absent as in the case shown. Again, juvenile tabes was commoner in the female sex. On the other hand, Friedreich's ataxy was marked by an absence of pupillary signs and the presence of ataxy; loss of the knee- and ankle-jerks was common to both diseases.

Mr. O. L. ADDISON showed a specimen of the spleen from a case of

Gaucher's Splenomegaly.

The spleen, which was removed under the impression that the child was suffering from splenic anæmia, was much enlarged and paler than normal and exhibited no capsular thickening. The glands at the hilum were enlarged; the viscus weighed 17 oz. and the weight of the child from whom it was removed was 19½ lb. The child recovered from the operation.—Dr. HAROLD PRITCHARD said the child was admitted to his wards during an attack of bronchitis. Systematic examination revealed enlargement of the liver, very great enlargement of the spleen as far as the umbilicus, and no enlargement of lymphatic glands. There was anæmia of the chlorotic type and leucopenia with a relative leucocytosis. The Wassermann reaction was negative. The true nature of the disease was only revealed by the microscopic examination of the excised spleen which showed the typical Gaucher's cells. Since the operation the child had appeared more contented; previously it had been very fretful. Gaucher's splenomegaly was apparently a very rare disease as he (Dr. Pritchard) had only been able to find 23 cases recorded in the literature.

Dr. PARKES WEBER said it was clear that Gaucher's disease was one of the whole reticulo-endothelial system and affected the endothelial cells of the liver and bone-marrow as well as those of the spleen. These cells were distended with a lipoid substance. Dr. McNee had demonstrated to him in sections of this spleen, which was an excellent example, that the bright lipoid substance was not doubly refracting and hence it could not be, as had been supposed, a cholesterin ester. The disease was evidently an inborn error of metabolism resembling alkaptonuria, hence its familiar occurrence.—Dr. J. W. MCNEE thought that Gaucher's disease was not so rare as had been supposed, for he had seen three cases in this country since the war. This specimen showed the lipoid in the cells better than any other he had seen. While the nature of the lipoid remained unknown it seemed in many ways to resemble the substance found in amyloid disease. Dr. A. K. GORDON pointed out that the characteristics of Gaucher's cells were not made visible by the methods ordinarily employed for staining sections. If frozen sections were stained with Giemsa's stain every stage in the formation of the Gaucher's cell from the lymphoidocyte could be observed.—Dr. F. J. POYNTON inquired whether the diagnosis of Gaucher's disease could be made during life and whether the operation of splenectomy was likely to improve the prognosis.—In reply, Mr. ADDISON said that in recorded cases splenectomy had not influenced the course of the

disease, and Dr. H. PRITCHARD added that the disease had on occasion been diagnosed by splenic puncture.

Mr. B. WHITCHURCH HOWELL and Dr. W. L. KINNEAR showed a case of

Fragilitas Ossium with Blue Sclerotics.

The patient was a girl, aged 3½, who had already suffered six fractures. The mother, who also exhibited blue sclerotics, had had fractures of the clavicle, wrist, radius and ulna, and humerus. The case was shown with a view to obtaining suggestions as to treatment. Dr. Kinnear said that there were only two cases of fragilitas ossium in the family and (in reply to Dr. Parkes Weber) that there was no family history of deafness. On an analogy with rickets he intended to try the mercury quartz-lamp treatment and possibly parathyroid medication.—Dr. A. FEILING considered that the disease was a general one and pointed out that the liability to fractures persisted after puberty. No treatment was known to avail.—Dr. HELEN MACKAY thought that the mercury vapour lamp was unlikely to be beneficial since its effect in rickets was that of cod-liver oil, which was known to have no effect in fragilitas ossium.—Dr. ERIC PRITCHARD had seen a case of multiple fractures do well with cod-liver oil and the mercury lamp treatment.

Dr. ERIC PRITCHARD showed a case of

Anæmia in a Premature Infant treated by Intraperitoneal Injection of Blood.

The technique of the injection was quite simple; the abdominal wall was either punctured with a blunt needle which would not injure the gut or a sharp needle was used to transfix a "pinched-up" fold of the abdominal wall.—Dr. IZOD BENNETT asked whether there was any evidence that red blood cells injected into the abdominal cavity reached the circulation, and Dr. GORDON pointed out that the result of injecting blood into the peritoneum was to produce an extravasation of phagocytes which rapidly ate up the red blood cells. He suggested that the child was suffering from some infection and that the benefit it had obtained, apparently from the injection of blood, was in reality due to the peritoneal reaction produced.—In reply, Dr. PRITCHARD admitted that it was difficult to see how the red blood cells gained access to the circulation.

Dr. W. E. HILLS showed

A Child in whom the Sex has not yet been Determined.

The PRESIDENT thought the child a boy, who exhibited an extreme degree of hypospadias.—Dr. POYNTON discussed two similar cases he had seen, and Dr. DONALD PATERSON said that cases which had been "opened" to determine the sex almost invariably proved to be males.

Dr. IZOD BENNETT showed a girl who exhibited

Choreiform Movements Persisting for Four Years.

The movements began after an attack of somnolence lasting 24 hours, and were treated initially with ice-packs with the result that the movements disappeared and a flaccid paralysis occurred which lasted two months. After a short interval, during which the child appeared normal, the movements returned. He had regarded the case as probably one of encephalitis lethargica, but one member had suggested that the movements were functional and might be cured by suggestion.—Dr. E. PRITCHARD and Dr. A. W. CARR agreed with Dr. Bennett's original diagnosis.

Other Cases.

Dr. R. C. JEWESBURY showed a case probably of retroperitoneal sarcoma in an infant with a swelling of the left side of the back which had grown visibly since December, 1923.

Dr. ERIC PRITCHARD showed a case of chronic interstitial nephritis in a child aged 8 months. Originally the child had been sent to Mr. Tyrrell Gray and Dr. D. Paterson as a case of vomiting thought to be due to congenital hypertrophic stenosis of the pylorus, but the true nature of the case was revealed by the low urinary urea output and the high urea content of the blood.

Mr. WHITCHURCH HOWELL showed a case exhibiting a local atrophy of muscle and subcutaneous fat affecting chiefly the right lower extremity. The child exhibited was the second child of first-cousins; the elder child exhibited no abnormality beyond slight albinism.—The case was discussed by Dr. PARKES WEBER, who pointed out the fibrous nodules over the shin. A number of similar cases where the upper limb was affected had recently been described and labelled "lipodystrophia progressiva" of the superior type.

Dr. BERNARD MYERS read a paper on methods of collecting records of sick children, and described a method of collecting statistics which had already been put into operation.

LIVERPOOL MEDICAL INSTITUTION.

A MEETING of this institution was held recently, Prof. J. HILL ABRAM, the President, being in the chair.

Dr. D. R. OWEN read a note on a case of

Abdominal Aneurysm.

Aneurysm of the abdominal aorta had occurred, he said, in a man previously in good health. A week after an attack of pain in the back diagnosed as lumbago he was sent into hospital with shock, distension of the abdomen, and tenderness, but there was no rigidity and no vomiting. At first it was thought there was a tumour in the region of the sigmoid and pancreatic disease was considered, although there was no glycosuria. The attack of pain subsided and an expansile tumour of the abdominal aorta was then clearly felt. One day later, and three days after the acute attack, the patient had another acute attack, collapsed, and died. Autopsy showed clots of varying duration in a retroperitoneal collection of blood from a rupture of a diffuse aneurysm about two inches above the iliac bifurcation. There was extensive ulceration and calcification of the aorta, and the leaking of the aneurysm probably accounted for the attacks of pain. The first acute pain occurred whilst lifting a weight when at work, and gave the case a forensic as well as a clinical interest, in that when admitted the case resembled an acute abdomen. The only treatment given was the intramuscular injection of saline containing horse serum, and the general treatment of shock.

Dr. ROBERT COOPE read a short paper on

Some Points in the Diagnosis of Pancreatic Disease.

After dealing with the difficulties of diagnosis he discussed briefly the acute and subacute lesions of the pancreas and their clinical features. Concentrating more particularly upon chronic disease of the gland, for example, scleroses of various types, and cancer, he mentioned certain helpful points in diagnosis which could be drawn from a consideration of its anatomical situation, its physiological functions, and the association in certain cases of similar trouble in the liver. The clinical picture of chronic pancreatic trouble was then discussed and a critical review was made of the various tests of pancreatic function. In Dr. Coope's experience it was rare in chronic pancreatic disease to get a marked excess of neutral fat in the fæces. In cases with excess of fat this was usually present as split fat and associated with blockage of the bile-duct. Loewi's adrenalin mydriasis test was unsatisfactory, as it was sometimes misleading in cases of gall-stones without any obvious pancreatic involvement. The diastase content of the blood and urine was usually normal or low, and therefore of little help. A helpful and simple finding was the presence in the fæces, under certain strictly controlled conditions, of marked striation of all the muscle fibres seen under the microscope. It was probably the putrefaction of this undigested muscle fibre which gave the intense

indoxyluria seen in many of these cases. Glycosuria was comparatively rare, a finding not surprising in view of the pathology of conditions causing blockage of the duct. Dr. Coope had had no experience of the examination of the ferments obtained by duodenal intubation, but mentioned Carnot's results, and his view that lipase is the most satisfactory ferment to examine from the point of view of diagnosis of pancreatic insufficiency.

Dr. H. S. PEMBERTON submitted some observations on the

Action and Therapeutic Value of Insulin.

After an account of its properties the in vitro action of insulin on glucose was discussed. Five theories of activity in the living organism were considered, stress being laid on the glycogen-forming view, in favour of which experimental work by Dr. L. Cunningham and the speaker in frogs on galactose curves in the blood and on the differences in glucose content of arterial and venous blood in normal and diabetic conditions was described. The paper concluded with some pessimism as to the permanency of betterment in the diabetic as a result of insulin exhibition, but with acknowledgment of the advance which insulin had caused in the study of carbohydrate metabolism.

Dr. A. G. GULLAN stated that he had found insulin with restricted diet very effective in cases of severe diabetes in young adults. Several of these cases had the insulin gradually reduced and were now sugar free for a considerable time after insulin was stopped, but of course their diet was a restricted one. He also mentioned an interesting case in an older man where chronic pancreatitis had been noted by a surgeon when performing an operation for infective cholecystitis; the patient had later developed diabetes, and had done extremely well with treatment by insulin when other methods of treatment had not been satisfactory.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF STATE MEDICINE.

Discussion on the Diploma of Public Health.

A MEETING of this section was held in the Royal College of Physicians of Ireland on Jan. 11th.

Dr. N. M. FALKINER read his presidential address, in the course of which he reminded the meeting that the first paper read before the section was by Dr. Thomas W. Grimshaw, Registrar-General, on Feb. 9th, 1883, under the presidency of Sir Charles Cameron, and that of the original council Sir John Moore still survived. In due course many valuable papers had been contributed adumbrating the statutory enactments which were ultimately passed and showing that the profession in Ireland had performed its duty in forwarding legislation in public health during the past 40 years. The President went on to discuss the status of the Diploma in Public Health, reviewing the proceedings of the General Medical Council since the year 1869 in this regard. The University of Dublin had established a Diploma in State Medicine in the year 1870. The name of Prof. William Stokes was notably connected with this achievement. The President suggested that the subject should be discussed under the following headings: (1) uniformity in education and examinations; (2) uniformity in nomenclature of degree granted; (3) formation of a State public health service, (4) a combination between the Irish universities and colleges for instruction and examination in public health qualifications; (5) the status of preventive medicine in preliminary medical education.

Sir EDWARD COEY BIGGER mentioned some Acts of Parliament which had been passed in the years 1913 to 1920 in the interest of public health. These included Acts relating to the notification of tuberculosis, provision of meals for school-children, notification of births, venereal diseases, the Ministry of Health, and the enactments for the registration of nurses and midwives. He described the steps which led to the new regulations for the Diploma in Public Health in 1920. He had visited two universities to inspect some examinations for this degree and had found that the instruction in them for this examination was far from being uniform. Later, the new rules which were at present in force were started. He was of opinion that no medical officer would be as proficient as he should be unless he had some knowledge of clinical medicine. This would enable him to deal with the difficulties of a general practitioner in a more sympathetic way. When the course of study for the D.P.H. had been lengthened from nine to 12 months it was decided that the amount of time which had previously been spent on the study of practical chemistry was not necessary, although, of course, it gave the students a good scientific training. However, the chemistry course was shortened and the bacteriology course was lengthened. Some were of opinion that the rules in connexion with this examination were now too stringent, but he personally thought they were not. Some time later on it might become necessary to have a modified examination in connexion with the public services.

Sir JOHN MOORE said that the question of nomenclature for the qualification of D.P.H. was provided for by Act of Parliament. In this Act there were three names given for it—State medicine, public health, and sanitary science. On and after Jan. 1st, 1924, no candidate who had not begun to study for D.P.H. before that date could present himself for qualification under the old curriculum. The new rules regarding the examination had been rather hardly spoken of by many people. He personally thought that the study entailed under the new curriculum could not possibly be got through in less than 12 months. In the past a medical officer of health had frequently come into conflict with a medical practitioner, and he thought that it was most necessary that a medical officer should himself, before he took up that office, have been in practice, as this would enable him to sympathise with the medical practitioner, who sometimes might make a wrong diagnosis in the case of some acute infection. In some ways Sir John Moore was opposed to the new regulations. He regretted greatly that when these regulations were drawn up all consideration of public services—the Navy, the Army, and the Air Force—had been lost sight of. It was extremely difficult for men in any of these services to get leave for such time as was required for study under the new regulations. The strongest protest against the new regulations had been made by the Royal Colleges of England. The rules now in force also made it very difficult for doctors in the colonies to obtain the diploma.

Dr. THOMAS HENNESSY said that in Great Britain there was a dictator of public health services, but in Ireland there had never been such an official, and he thought this was a pity. In the Local Government Board the medical men had practically no power at all, and the laymen always counted for much more than did the medical men. He himself had often wondered what was the actual worth of the D.P.H. In Limerick recently there had been an election for a tuberculosis officer and there were three candidates, two of whom had the diploma. The position was given to the candidate who did not hold the diploma, and the other two were rejected.

Sir WILLIAM THOMPSON said that he thought the work of preventive medicine was becoming of more and more importance, and that in the future medical men would be able to accomplish more good by it than by any other means. The Act regarding the notification of tuberculosis was, in his opinion, not framed strongly enough. By this Act it was only necessary to notify two classes of tuberculosis: (1) surgical tuberculosis—cases in which there was a discharge and where the wound had to be dressed; (2) pulmonary tuberculosis in the last stage. He felt sure that every medical man would agree with him that, as regards the prevention of tuberculosis

notification only of cases such as these was useless. Regarding infant mortality, he based his figures on the registration of births. For a number of years the infant mortality had been going down, and it was only during the last ten years that any Acts of Parliament had been brought in dealing with this matter; most of these Acts were voluntary, and not compulsory.

Dr. T. P. C. KIRKPATRICK said that the founding of the examination for D.P.H. in connexion with the College of Physicians was largely due to the work of Dr. Grimshaw, who was a very ardent supporter of public health. In March, 1882, he proposed that a Diploma in Public Health should be established, and in February, 1883, at his instigation the College of Physicians granted the D.P.H. after an examination.

Dr. J. C. O'FARRELL said he thought if the Section of State Medicine of the Royal Academy of Medicine in Ireland asserted itself more and brought itself into contact with the health authorities in Dublin that a great deal of good could be done regarding the health of the community. At present, for instance, houses were being built in which the rooms were absurdly small. These houses would accommodate large families and probably there would be six children sleeping in each room. Again, the supply of milk was unsatisfactory. Members of the Section of State Medicine of the Royal Academy of Medicine should make efforts to ensure that houses which were built had proper accommodation, that the rooms were sufficiently large, and also that a proper supply of good milk was obtained for the poor of Dublin. He believed that if the views of the section on these subjects were brought before the general public some good would result. He thought that to men in that country at any rate the D.P.H. was of very little use. Institutions for tuberculosis were governed and practically run by laymen, and the doctor, even if he had his D.P.H., was repulsed if he made any suggestions; he generally had no one to rely upon to back him up or to go to for advice. He thought if the health of the nation was to be improved the Section of State Medicine would have to assert themselves a great deal more and that the work which they did should be brought before the public and before the other authorities on public health.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Jan. 17th, Dr. G. M. DUNCAN, the President, being in the chair.

Mr. F. K. SMITH read a paper on

Gall-stones: a Review of 120 Surgical Cases.

Mr. Smith, assisted by Mr. Gordon Bruce, had studied the records of 120 cases operated upon for gall-stones in the wards with which he had been associated, and from the information obtained he was able to draw certain conclusions with regard to the results of recognised methods of surgical treatment, the dangers associated with operation, the main causes of mortality, and the frequence of recurrence of biliary trouble. In many of the cases, 19 of which were males and 101 females, symptoms had been present for 10 or 15 years, with the result that there was an impaired biliary and hepatic system with the usual signs, in addition, of old-standing systemic disease, so that the operative risk was very high. The cases were divided into two classes—acute (i.e., the acutely infected cases, not necessarily those with acute biliary colic) and chronic.

The majority of the acute cases, after having premonitory signs of biliary disease for years, became rapidly ill with the suddenness typical of the acute abdomen. Mr. Smith traced the usual course of events in such cases, and referred to cases of special interest in his series, such as acute hæmatogenous cholecystitis and progressive cholangitis. Most of the acute cases were treated by cholecystectomy, and out of a total of 32 operated upon the mortality was 11, being much greater among men than among women. Of those who survived, 18 replied to a letter of inquiry sent out more than two years after operation, and 15 expressed themselves as in very good health. From his review of the acute cases, Mr. Smith concluded that improved results could best be obtained not by devising new operative measures, but by improvement in technique, and by reducing the number of acute cases—i.e., by earlier diagnosis or by earlier operation. Mr. Smith then detailed symptoms and signs which might be produced by an acute infection of the gall-bladder, and briefly discussed the comparative merits of cholecystectomy and cholecystostomy in these cases, some points in the operative technique, the prevention of hæmorrhage in jaundiced cases, and post-operative care in general. In the whole series there were five cases of malignant disease.

In the group of chronic cases there were ten of chronic cholecystitis without calculi, and in these multiple abdominal lesions were the rule. Most of these were treated by cholecystectomy but the results were poor. Cases of calculi in the common duct numbered 23; jaundice was present in about half the number. Of chronic cholelithiasis there were 55; 27 were treated by cholecystectomy with two deaths, the end-results in the survivors being good, and 28 by cholecystostomy, also with two deaths. From a general survey of this group Mr. Smith concluded that in these cases cholecystectomy gave better results than cholecystostomy as regards both general condition and recurrence of gall-stone symptoms.

Discussion.

Dr. J. CRUICKSHANK mentioned various theories of the causation of gall-stones which he tabulated as (*a*) infection; (*b*) hypercholesterolæmia; (*c*) possibility of some disorder of metabolism—suggested by the association of usual age, sex, and general obese type of patient. He described some animal experiments now being undertaken by which ordinary small stones (gravel) were implanted into the gall-bladders of rabbits, but what this might produce was not yet definitely established.—Mentioning the greater frequency of occurrence of gall-stone cases, Prof. JOHN MARNOCH gave this only as an impression, though a very definite one, formed during his own career as a surgeon in the north-east of Scotland. He stated that during the past 20 years or so gall-bladder calculi cases had undoubtedly become much more common in proportion as cases of vesical calculi had declined in number. Had change of diet, he asked, anything to do with it?—This impression was corroborated by Dr. J. E. SKINNER, of Skene, from his experience in general practice. He also laid stress on the importance of early diagnosis and early investigation of suspected cases from the point of view of the possibility of metabolic disorder.—Dr. A. G. ANDERSON, Mr. G. H. COLT, Dr. J. D. WHITE (who discussed the X ray investigation required), Dr. ROSS MACKENZIE (who recommended gas and oxygen as the anæsthetic of choice for operation), and Mr. G. S. DAVIDSON also spoke.

DEVON AND EXETER MEDICO-CHIRURGICAL SOCIETY.—The annual meeting was held at the Royal Devon and Exeter Hospital on Jan. 24th, the retiring President, Dr. G. P. Hawker, being in the chair for the business portion of the meeting. The Council of the society, in presenting their annual report, mourned the loss of three original members, two of whom had died during 1923—Drs. G. T. Clapp and J. Delpratt Harris, and Mr. A. C. Roper. The following were elected as office-bearers for 1924: President, Dr. C. Vincent Smith; vice-president, Dr. E. J. Toye; hon. sec., Mr. R. Wayland Smith; reporting hon. sec., Dr. G. L. Thornton; hon. treasurer, Mr. A. L. Candler; hon. auditors, Drs. Bernard Kelly and Shirley Steele-Perkins; Council, Dr. R. V. Solly, Dr. Ransom Pickard, Dr. R. Eager, Mr. N. Lock, Dr. A. Hipwell, and Dr. Dobson Smythe. Drs. R. V. Solly and Ransom Pickard were elected hon. members as an appreciation of the long and valued services they had given to the society. Cases were then shown.

Reviews and Notices of Books.

OBSTETRICS AND GYNÆCOLOGY.

A Combined Text-book, by J. M. MUNRO KERR, M.D., F.R.F.P.S. Glasg., Professor of Obstetrics and Gynæcology, Glasgow University; JAMES HAIG FERGUSON, M.D., F.R.C.S. Edin., Gynæcologist, Royal Infirmary, Edinburgh; JAMES YOUNG, D.S.O., M.D., F.R.C.S. Edin., Assistant Physician, Royal Maternity Hospital, Edinburgh; and JAMES HENDRY, M.A., B.Sc., M.B., Senior Assistant to the Muirhead Professor, University of Glasgow. Edinburgh: E. and S. Livingstone. 1923. Pp. 1006. 35*s*.

THE first attempt to close the gap which exists between the art of midwifery and that of the treatment of diseases peculiar to women was made in the "Encyclopædia of Midwifery and Diseases of Women," edited by Dr. John S. Fairbairn in 1921, a monumental work of reference well adapted to the needs of the practitioner. In the present volume the same principle is adopted in the compilation of a text-book, which, as the authors note in the preface, is intended to impress the medical student with the fact that the great majority of ailments encountered in gynæcological practice are the result of infections and injuries contracted during parturition. With this statement few will disagree, but in a composite volume there may be some divergence of opinion as to the relative amount of space that should be devoted to each subject. In the present instance, the authors have given roughly three-fifths of the book to obstetrics and two-fifths to gynæcology. The volume is divided into ten parts. The first of these deals with anatomy and physiology and methods of examination, both in the non-pregnant and pregnant state. The next seven sections are devoted exclusively to the discussion of obstetric subjects. Gynæcology is relegated to the concluding two sections of the book, the first comprising chapters upon diseases of the female pelvic organs, including the bladder, rectum, and pelvic colon, and the last section including surgical technique and a description of various gynæcological operations.

However simple the principle may seem, the task of correlating two subjects, even so closely related as obstetrics and gynæcology, is no easy one, but this volume may be taken as a notable and praiseworthy attempt to deal with a difficult problem. Part I. attains the authors' object admirably, and we should like to see the same fusion in other sections of the book. The arbitrary wall between the two sciences still appears a little too high, and might be further broken down with advantage. For example, is it too much to hope that some day we shall see "displacements of the uterus and pelvic floor" considered primarily as a late obstetric complication? The same applies to certain chronic inflammatory conditions of the pelvic viscera still retained in the purely gynæcological chapters of the book. The connecting chapter between obstetrics and gynæcology might be developed in subsequent editions with considerable advantage, or, better still, a new "Part" introduced to include in a series of chapters all those diseases which are the result directly and indirectly of the pregnant state. The gynæcological sections would undoubtedly suffer, but the avowed aim of the authors to correlate more closely obstetrics and gynæcology would, we think, be still further attained. The subject-matter of the book is excellent, and there is an absence of debatable material which is commendable in a book designed for the student. The chapters dealing with obstetrics are particularly good, and the value of the text throughout is increased by the inclusion of a series of figures admirably reproduced, many of which have already done good service in Kerr's "Operative Midwifery and Clinical and Operative Gynæcology."

The book is a notable advance in teaching, and both student and practitioner will undoubtedly appreciate the advantage of possessing in one cover a symposium of modern views covering all that is necessary in the allied sciences.

ENDOCRINE DISEASES.

Including their Diagnosis and Treatment. By WILHELM FALTA, Professor of Medicine, Vienna. Translated and edited by MILTON K. MEYERS, M.D., Neurologist to the Northern Liberties Hospital, Philadelphia. London: J. and A. Churchill. 1923. With 104 illustrations. Pp. 669. 36*s*.

Dr. Meyers has brought out a third edition in English of Prof. Falta's well-known book on ductless glandular diseases. The title has, however, been altered to that of Endocrine Diseases since this name has now come into general use. In the ten years which have elapsed since Falta published the original work a great deal of new and important work has been done. The editor has endeavoured to add this to the latest edition and it is a great advantage to have this new work incorporated, especially since in each section it is so arranged that it can be read separately, while the original text can be followed easily. Where a statement of Falta's has been completely disproved the correction is made. The introductory chapter gives a general survey of the action of the ductless glands which is of great interest and has been brought up to date by the editor. In the next two chapters 120 pages are given up to the discussion of the thyroid gland and its diseases and make interesting reading. The newer work does not essentially alter Falta's views, though thyroxin, the active principle of the gland, has been isolated and prepared. Falta's objections to dysfunctions are supported by the editor, although he does not think that the question is finally settled. No mention is made of the observation that auricular fibrillation often occurs in severe cases. The diseases of the pituitary are very fully dealt with, although the reproductions of the skiagrams are not clear. The chapter on the pancreas is the least satisfactory, since so much new work had been done on the physiology of the Islands of Langerhans even before the discovery of insulin. Falta's account is now inadequate and the editor has not added much of the new work, although there is a bare reference to insulin. The parathyroids and suprarenals are well described.

The translation has, on the whole, been well done, although the construction of the sentences is often on German lines, and some of the translations are clumsy. The references to the literature are placed at the end of the book instead of after each chapter, but are extensive and useful. There is a good chapter index and also a full index. The book is a valuable one if only because of the amount of information which is collected together. It is well printed and bound.

UROLOGY.

By E. L. KEYES, M.D., Ph.D., Professor of Urology, Cornell University Medical College; Urologist to Vincent and to Bellevue Hospitals. London: D. Appleton and Co. 1923. Pp. 781. 35*s*.

THIS is the fourth revision of a well-known text-book. There are a number of changes. New methods have been introduced, two new sections, on suppurative inguinal adenitis and granuloma inguinale, added, whilst gonorrhœa in the female and syphilis have been dropped as having no place in urology. The book is so widely known that detailed criticism of this edition is not necessary. The author has brought the work thoroughly up to date and his recommendations throughout bear the stamp of practical experience. The prominence given to the phenol-sulphonephthalein test of renal function labels the country of

origin of the book. It seems curious to our workers that the American surgeon almost never employs such a simple and efficient test as that of the urea-concentrating power of the kidney. But there are subjects dealt with in this book, such as perineal prostatectomy and operations upon the seminal vesicles, which are inadequately treated in our own text-books. It seems a little pessimistic to speak of implantation of the ureters into the rectum for exstrophy of the bladder as a "confession of failure," but the teaching throughout is sound in a large volume on an extensive subject. The book is well illustrated and should certainly maintain its popularity.

An Introduction to Surgical Urology. By W. K. IRWIN, M.D., F.R.C.S. Edin., Honorary Casualty Out-patient Surgeon, St. Paul's Hospital for Genito-Urinary Diseases. London: Baillière, Tindall and Cox. 1923. Pp. 180. 7*s.* 6*d.*

THIS small book has been written that it may help to elucidate the outstanding features of surgical urology, a subject which the author describes as a "terra incognita to many practitioners" without justifying his criticism of his colleagues. After preliminary sections on anatomy and clinical examination, separate chapters are devoted to the several symptoms of urinary disease, such as frequent micturition and pyuria. Whilst this arrangement has certain advantages, it renders it difficult to collect the scattered information about any particular urinary condition. In the case of prostatic disease there appears a systematic chapter dealing with this derangement alone. The teaching soundly reflects the practice of English urologists. There are no illustrations.

ATLAS OF OTOLOGY.

Illustrating the Normal and Pathological Anatomy of the Temporal Bone. By ALBERT GRAY, M.D., F.R.S.E., F.R.F.P.S.G., Lecturer on Diseases of the Ear, Glasgow University. Glasgow: MacLehose, Jackson and Co. 1924. Pp. 49. £6 6*s.*

WE congratulate Dr. Gray on the production of a beautiful atlas. The plates are exquisite reproductions of the author's own photographs of specimens prepared by himself, and they must represent many hours devoted to this labour of love. A large number of the photographs are stereoscopic, a method particularly valuable in bringing out minute details of the anatomy of the temporal bone; a small stereoscope consisting of a pair of convex lenses is provided with the book. Most of the pictures are in magnification, the degree being always stated in the text, and several are photomicrographs. The atlas consists of 44 illustrations of normal and 19 of pathological anatomy, the principal subjects shown being the changes due to suppurative otitis and to otosclerosis; for his researches into the pathology of the latter disease Dr. Gray has obtained a very high reputation, which gives an additional interest to his specimens. Each illustration is accompanied by a short explanatory text. Dr. Gray states that he is aware that this work does not give a complete presentation of the subject, and hints that a supplementary volume may be published at a later date. To this event otologists will look forward with eagerness.

CURES.

By JAMES J. WALSH, M.D., Ph.D., Sc.D., Professor of Physiological Psychology, Cathedral College and College of the Sacred Heart (Manhattanville), New York. London and New York: D. Appleton and Co. 1923. Pp. 284. 8*s.* 6*d.*

Prof. Walsh has written an entertaining book on "cures which have failed"—that is, cures which have been in fashion for a season as panaceas for all mortal ills and then have died a natural death, just as their supporters did. The subject is dealt with in a tolerant, often humorous, vein. "Poor human nature," says the author, "when ailing, like a drowning man, grasps at a straw, only the amusing thing is that his mind so often turns the straw into a solid beam of hope on which he floats into the harbour of good health when he thought he was seriously ill. Why should not human nature have its delusions when they add to the happiness of men? It is not with the idea of eradicating the delusions that this book is written, but so that we may altogether laugh a little quietly at this human nature of ours and its humorous ways." Somewhat prophetically, perhaps, neither psycho-analysis nor Mr. Coué are spared. In showing that most of the "cures" were effected on the malade imaginaire, the book itself will doubtless prove a most effective cure—for a season—for that type of patient who is for ever seeking something new, and to such the physician might well prescribe it.

CLEFT LIP AND PALATE.

By T. W. BROPHY, D.D.S., M.D., LL.D., F.A.C.S., O.I., Sc.D., F.A.C.D., Emeritus Professor of Oral Surgery, Chicago College of Dental Surgery; formerly Professor of Dental Pathology and Surgery, Rush Medical College. London: Henry Kimpton. 1924. Pp. 340. 30*s.*

IN this book the author describes his views on a controversial subject, the treatment of cleft palate. It embodies the experience of 40 years and the author has operated upon a very large number of patients. Since 1915 he has performed nearly 2000 cleft palate operations and the total number to his credit is 5076. The teaching derived from such a vast experience demands our most careful attention. Though the author described a bone operation many years ago, the principles upon which it was based have not been fully appreciated in this country, where it has never been given an extended trial, and has been condemned by some surgeons perhaps too hurriedly. There is a mass of evidence retailed in this volume which speaks for the soundness of the author's methods and calls for a practical investigation of its truth. Although an enthusiast for his own operations, the author does not push his recommendations beyond the limits of prudence, and when need be employs the methods worked out by other authorities. It would require a good deal of evidence to refute two of his principles—that early closure of the cleft gives a greater likelihood of perfect speech and that tension-relieving muscular incisions in the soft palate always tend to be destructive of speech prospects. To grasp the fundamental ideas underlying the author's treatment, the book must be read. Suffice it to say here only this, that the criticism so often made that the early bone operation on infants is a dangerous one, is not supported by the statistics set forth in the book; the percentage of deaths in children operated upon during the first year of life has amounted since 1915 only to 2·9. This is little more than one-third Chicago's infant mortality for the same age, but it must be remembered that the children are required to reach a certain standard of health before operation can be contemplated.

The book should certainly be consulted by all those who treat this deformity in children.

JOURNALS.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXVII., No. 1. Pp. 1–144. January, 1924.—A Stable Preparation of Hydatids for the Complement-fixation Test, by S. W. Patterson and Miss F. E. Williams (Melbourne). An alcoholic extract of scolices from the cysts in infected men or animals, evaporated to dryness and taken up in salt solution forms a stable specific preparation for the diagnosis of hydatid disease. It should be particularly useful in places, such as England, where such diagnostic tests are wanted only occasionally.—The Significance of Anisotropic Fatty Substances in Myelomatous Tumours, by S. C. Dyke (London). A myeloma

of the head of the tibia and two tendon-sheath myelomata all show foamy cells stuffed with doubly-refractile cholesterol-esters. This is in favour of the endothelial origin of these tumours.—The Histology of the Central Nervous System in an Acute Case of Encephalitis, by C. Da Fano (London). A case of lethargic encephalitis fatal in 36 hours. The author gives a beautifully illustrated account of the histological changes and of the occurrence of the "minute bodies" previously described by him.—The Effects of Vitamin-Deficient Diets on Rats with special reference to the Motor Functions of the Intestinal Tract, by L. Gross (London).—The Morbid Anatomy, Histology, and Blood Changes in Anaphylaxis in the Dog, by H. R. Dean and R. A. Webb (Manchester and Cambridge).—The Effect of Experimental Exclusion of the Liver on the Formation of Bile-pigment, by J. W. McNee and B. Prusík (London). In 15 experiments hæmoglobin was introduced into the circulation of dogs from which the liver was completely excluded; in two cases only was the formation of any bile-pigment determined. The conversion of hæmoglobin to bilirubin does not therefore take place rapidly in the absence of the liver.—The Quantitative Estimation of Isohæmagglutination, by C. Price-Jones (London). No quantitative studies of the group agglutinations of human red cells seem to have been published. The degree of agglutination varies directly with time and the concentration of serum, and also with the concentration of red cells, thick suspensions showing relatively more agglutination than thin ones. The author was unable to separate mixtures of red cells of different groups quantitatively with a serum which should agglutinate one group only. With dilute suspensions, care must be taken to avoid contact hæmolysis.—An Aldehyde Mordant for Fats and Lipoids, by J. Lorrain Smith and T. Rettie (Edinburgh). Acetaldehyde is a good mordant in the bichromate-hæmatoxylin method of staining lipoids.—Celluloid Museum Jars, by W. D. O'Kelly (Dublin). Directions for making serviceable jars from thin sheet celluloid.—Staining Tubercle Bacilli in Formalin-fixed Tissues, by E. G. D. Murray (Cambridge). Tubercle bacilli are difficult to stain after formalin fixation; this may be corrected by the destruction of the formalin by ammonia.—The Application of a Sulphite-glucose-iron Agar Medium to the Quantitative Estimation of *B. welchii* and other reducing Bacteria in Water-supplies, by W. J. Wilson and Miss E. M. Blair (Belfast). A useful addition to the bacteriological tests of water.—The Antiseptic Action of Anil-pyridines and Anil-quinolines, by C. H. Browning, J. B. Cohen, S. Ellingworth, and R. Gulbransen (Leeds and Glasgow). A continuation of the authors' important studies on the relation between chemical constitution and bactericidal action.—Cystine in Bacterial Metabolism, by J. Gordon (Leeds). Organisms such as the coli-typhoid group and the anaerobes which can break up cystine with the formation of H_2S grow well in cystine media; more delicate organisms which cannot split it are highly sensitive to small concentrations. Serum has some protective effect.—A Malignant Tumour of Kidney, by J. B. Duguid (Aberdeen).—The Preparation of Dry Bone Specimens, by W. E. M. Wardill (Newcastle).—Digestion with Cultures of staphylococcus, *B. proteus*, and *B. sporogenes* gives good results.—The Histology of the Gall-bladders Excised from Three Enteric Carriers, by R. P. Smith (Glasgow). A subacute cholecystitis affecting mainly the interstitial tissues was found in each case, in one instance with a markedly focal arrangement.—The Germination Period and Mortality of Anthrax Spores, by M. B. R. Swann (Cambridge). The time taken till the first division of the bacillus is with young spores uniformly about 70 minutes at 37°C; with old spores it varies from two to seven hours. About 5 per cent. of young and about 55 per cent. of old spores are dead.—The Influence of the Visible Spectrum on the Growth of Bacteria in Artificial Culture, by T. J. Mackie and S. van der Lingen (Cape Town). The varying reactions of the different organisms tested cannot be summarised; on the whole, red light had the greatest inhibitory effect, but as the intensity of illumination was controlled by an actinometer it is not clear that the results are comparable. In some cases the inhibitory effect of the whole spectrum was less than that of a fraction.—A Pipette Controller for Measuring Small Quantities of Fluids, by E. C. Smith (Dublin).—Diphtheria: Problems in Schick Testing and Active Immunisation, by R. A. O'Brien (London). Five statements may now be made which are so nearly true that exceptions are of no practical importance: (1) Schick negatives are not susceptible to diphtheria; (2) Schick positives are susceptible; (3) Schick positives never harbour virulent bacilli unless they have diphtheria; (4) carriers of virulent bacilli are always Schick negative; (5) avirulent bacilli do not cause diphtheria.—Sacrococcygeal Teratoma containing Gliomatous, Chordomatous, and Ependymal-carcinomatous Tissue, by K. G. Pandalai, W. L. Forsyth, and M. J. Stewart (Leeds).

ARCHIVES OF INTERNAL MEDICINE. Dec. 15th, 1923.—Thyroid Physiology in the Control of Thyroid Disease, by David Marine, New York. Thyroid physiology is reviewed with particular reference to the effect of relative or absolute iodine deficiency on the structure of the gland. The influence of the interrenal glands on thyroid activity is dealt with and the results of adrenal insufficiency experimentally produced in rabbits are recorded. The subject is discussed in relation to the ætiology of exophthalmic goitre.—Elective Localisation in the Eye of Bacteria from Infected Teeth, by Russell Haden, Kansas City. Cultures grown from the root tip or pulp of patients suffering from metastatic eye infections were injected into 66 rabbits; 45 of these developed eye lesions. Similar cultures from the teeth of patients not suffering from eye infections were injected into 169 rabbits, and of these only 25 developed eye lesions. Case histories and good illustrations are given.—Renal Injury Produced in Rabbits by Diets Containing Meat, by L. H. Newburgh and S. Clarkson, Ann Arbour. Rabbits were fed for varying periods on a high protein diet. The majority of rabbits that ate a diet containing 27 per cent. or more of protein for six or more months developed a chronic nephropathy.—Periarteritis Acuta Nodosa, by W. Ophuls, San Francisco. Very complete clinical and pathological details of a case of periarteritis nodosa are recorded, together with micro-photographs of the lesions and extensive bibliography. The author suggests that the disease has some relation to subacute "septic rheumatic" infections.—E. B. McKinley, Dallas, reports the treatment of seven patients suffering from various infections with the bacteriophage of Twort and d'Herelle.—C. P. Miller and A. Branch, New York, report the clinical course and post-mortem findings in a case of subacute bacterial endocarditis due to a hæmolytic hæmophilic bacillus.—I. M. Rabinowitch, Montreal, maintains, on the basis of observations made on 200 patients, that the urea-concentration factor is a more sensitive test of renal efficiency than the other tests now in use.—Treatment by Splenectomy of Essential Thrombocytopenia, by N. E. Brill and N. Rosenthal, New York. The cardinal signs of essential thrombocytopenia (purpura hæmorrhagica) and the reasons for regarding it as a distinct clinical entity are given. Two cases of the disease are reported in detail, in both of which striking improvement followed splenectomy. The pathogeny of the condition is discussed and there is a bibliography.—Douglas Vanderhof reports seven cases of Subacute Combined Degeneration of the Cord with absence of free hydrochloric acid in the stomach as determined by fractional test-meal analysis. Emphasis is placed on the importance of adequate hydrochloric acid therapy in this condition.

Messrs. W. Heffer announce that two books by Dr. T. S. P. Strangeways, on "Tissue Culture in Relation to Growth and Differentiation," and on "The Technique of Tissue Culture in Vitro," will shortly be published.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

V.—TRANSFER OF PRACTICES: POINTS FOR THE VENDOR.

BY COLIN M. OLIVER
AND
OSWALD A. HEMPSON.

It is naught, it is naught, saith the buyer; but when he is gone his way, then he boasteth.
—Proverbs xx. 14.

IN a previous article we dealt with certain points which, it was hoped, might be useful to a medical man when seeking to purchase a practice. In this article we propose to consider a few matters which may be of interest and assistance to those members of the profession who contemplate selling the whole of, or a share in, an established medical practice.

Employment of an Agent.

Having decided to sell his practice, the first step is obviously to get in touch with likely purchasers, and to place before them as clearly and concisely as possible full details of the practice. To this end a vendor should consider first whether he desires to employ the services of an agent or to get in touch with prospective purchasers direct through the medium of an advertisement in the medical press. If the former course is decided upon, he should be careful to select a reputable medical transfer agent upon whom he can rely to safeguard his interests.

In employing an agent the vendor should realise that the agent's commission is payable by him as vendor, and before giving definite instructions for the disposal of the practice he should ascertain the scale of such commission, and on what it is actually based and to what it extends. Further, in order that there should be no possibility of dispute at a later date, he should take care to agree when such fee shall be deemed to be earned by the agent and payable to him. For example, whether when the contract is signed, when a willing purchaser is introduced, or when the purchase money is actually paid.

It is inadvisable to instruct more than one agent as if, as sometimes happens, particulars of the practice are sent to a purchaser by more than one agent they may both claim commission as being the agent instrumental in effecting the sale. Some of the better-class agents have a mutual arrangement by which in such circumstances the commission is divided between them, or else an agreement between them provides for the ready determination of the question. Unfortunately, all agents are not parties to such an arrangement, and in case of dual claims difficult questions will arise as to which agent actually introduced the purchaser, and in the end the vendor may have to pay two or more commissions. This danger can be met by arranging with the agents when instructing them that, if any such question does arise, only one commission shall be payable, which must be shared amongst them.

If the vendor prefers to dispense with the services of agents, he can do so by inserting his own advertisement in the medical press. In this event, he should take care not to give full indication of his identity or the exact locality of his practice, as it is in some cases very damaging to the practice if the patients hear that there is likely to be a change before the purchaser is actually introduced into it. In addition there is the danger of a not too scrupulous agent taking advantage of the knowledge thus gained to introduce a purchaser and thus try to establish a claim for commission.

Supply of Information.

Having placed the disposal of the practice in train, the vendor must be prepared to supply all reasonable information which a purchaser may require. At this point it is permissible to emphasise the importance of keeping clear and accurate accounts of a practice in such a form that an accountant or other investigator of the accounts on behalf of a purchaser can easily follow them so as to check the gross income for the purpose of verifying the purchase price, and to ascertain the various sources from which the income is derived.

The purchase price is usually based upon an agreed number of years' purchase of the average gross receipts for the three years immediately preceding the date of purchase. In order to enable the investigator to verify the earnings of the practice, it is most advisable to pay all takings from the practice into a banking account, whether such takings are received in the form of cheques, postal orders, or cash, as by so doing the bank pass-book acts as a check upon the figures shown in the books of account.

In a previous article we enumerated the scope of the inquiries which a careful purchaser should make when investigating a practice offered to him for sale. It is not therefore proposed to set these out again. A vendor should be prepared with all the information there suggested. He should obviously take care to state fully all the advantages of the practice, but it is of equal importance that he should not conceal or withhold information which might affect a purchaser in deciding to buy. It is true that the legal maxim "caveat emptor" applies to these transactions, but this would not be an adequate defence to an action for damages by a disappointed purchaser where there has not been a full disclosure of material facts or where there has been misrepresentation of facts. For his own protection, too, the vendor must bear in mind that whatever he may do he cannot guarantee that his successor will retain the practice which he has bought, so he should ensure that, even though disappointed, the purchaser can have no claim upon him for his lack of success.[1]

Payment by Instalment.

In the previous article also we discussed the amount of the purchase price, but it should be remembered that the prices there referred to relate to an average practice possessing no specially attractive features. Where such features exist, a vendor may ask and expect to receive an increase upon such average purchase price commensurate with the special features. He should remember that the amount to be realised is ruled by the question of supply and demand when dealing with medical practices as much as in dealing with commercial commodities.

Having found a purchaser, and having satisfied his inquiries, it is often found that such purchaser is unable to pay the whole of the purchase money in cash, and accordingly may ask to be allowed to pay for the practice by instalments. At the present time when capital is scarce, a vendor will often be well advised to accept payment in this manner, provided that a substantial amount is paid down in cash and adequate security is given for payment of the balance, and also that interest is paid upon the balance from time to time outstanding. It is, of course, essential to examine the security offered somewhat critically, as once a purchaser has entered into possession of the practice it will certainly be difficult and often disastrous for a vendor to return to it if the purchaser makes default in payment.

Security for Deferred Payment.—The security may take a variety of forms. The most usual are a guarantee by some third person, a deposit of actual securities, or, in the case of a panel practice, a charge on the panel receipts. When a guarantee is offered, the vendor should obviously make careful inquiries as to the financial standing and position of the guarantor. The guarantee can be effected either by joining the guarantor as a party to the assignment of the practice

[1] It should also be borne in mind that litigation even for the successful litigant is an expensive matter, and so the vendor should be careful to lay before the purchaser everything which is material.

from the vendor to the purchaser or by separate instrument.

It is unnecessary to comment upon the second alternative, except to point out that when a life assurance policy is offered as security, its surrender value should be ascertained and it should only be regarded as an actual security to the amount of the surrender value. A new policy which has acquired no surrender value is therefore of no actual security, except in the case of the death of the purchaser before the whole of the purchase money is paid. From this aspect a life policy is a good security, but it should be considered as a collateral only and not a primary security.

The charge upon the panel receipts—which is perhaps one of the most satisfactory forms of security—is effected by the purchaser agreeing with the vendor that the cheques payable by the insurance committee in respect of the panel patients of the practice shall be paid to the vendor until the balance of the purchase money and interest thereon is paid. It is, however, sometimes provided that such cheques shall be paid to and received by the purchaser until he shall make default in payment of any instalment or interest, in which event the vendor shall be at liberty to give notice to the insurance committee requiring the cheques to be paid to him until all sums payable have been received.

Where the purchase money is payable by instalments the vendor should insist that, in the event of the purchaser selling the whole or any share of the practice before he has paid for it in full, the balance of the purchase money then owing shall forthwith become payable, and a clause to that effect should be inserted in the assignment of the practice to the purchaser.

Book Debts.—If these are sold with the practice they must be valued in order that the purchase price may be ascertained and due allowance must be made for bad and doubtful debts. In this case, the purchaser should be given a power of attorney to enable him to collect them, such power of attorney is incorporated in the assignment of the practice. By adopting this course a vendor will relieve himself of the trouble and expense of collection.

If the book debts are not sold with the practice, it is fair that the vendor should submit to a clause in the assignment whereby he is precluded from taking proceedings to recover the amount due from any patient for a period of 6 to 12 calendar months from the date of the sale of the practice, except where a patient dies, becomes or is likely to become bankrupt, or leaves the neighbourhood, and except where the debt is likely to become irrecoverable by the operation of the Statute of Limitations unless proceedings are taken for its recovery at an early date. In this event, also, it is not unreasonable to allow the purchaser a commission not exceeding 10 per cent. upon any book debts which he may collect for the vendor.

Restraining Clauses.

A vendor must also submit to a clause in the assignment precluding him from practising within a reasonable radius from the centre of the practice. A purchaser, however, cannot ask that this radius shall be wider than is necessary for the purpose of affording him adequate protection from competition by the vendor. If it is arranged that the purchaser should have a preliminary partnership, or should serve as an assistant to the vendor before exercising his option to purchase, the vendor should insist that the agreement should also contain a clause precluding the purchaser from practising in opposition in the event of the purchase not being completed.

If the vendor is selling his practice with a view to giving up general practice and devoting himself to practise as a specialist or consultant, the clause restraining him from practice should be so worded as to permit of his so doing, but in such circumstances it would not be unreasonable for the purchaser to ask for some rebate in the purchase money by reason of the fact that the vendor is allowed to attend patients of the practice even as a specialist or consultant. The vendor also might expect the purchaser to insist on the deduction from the gross receipts on which the purchase is to be based of any fees derived from consultations or from the special branch of medicine or surgery to which the vendor intends thereafter exclusively to devote himself.

The definition of the term consultant or specialist is by no means easy, but for his own protection, and in order to avoid dispute in the future, it is very desirable that these terms should be defined as closely as possible in the assignment. It will usually be of sufficient protection to the purchaser if in such cases the vendor is bound to charge a minimum fee of from 2 to 3 guineas for every consultation upon any person who has been a patient of the practice.

The vendor must also remember that the restraining clause operates not merely for the life of the purchaser, or the period of his retention of the practice, but unless restricted in point of time by the actual terms of the assignment, it attaches to the goodwill, and the benefit of it can be assigned to the successor of the purchaser, and so on, throughout the life of the vendor.

In this article we have dealt almost exclusively with the sale of an entire practice, but most of our remarks, warnings, and comments apply equally to the sale of a share in as to the sale of an entire practice. In the sale of a share of a practice, the actual assignment is embodied in the articles of partnership which set out the rights and obligations of the parties.

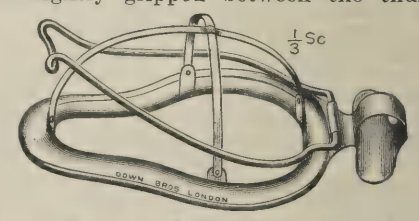
A Warning.

One last word. Every medical man, before selling his practice or a share in it, should make certain that the purchaser is a duly registered medical practitioner. This may sound obvious, but experience has shown that this is necessary, as even that excellent publication, the Medical Directory, has been misled before now, and contained the names of persons who have fraudulently assumed the name and qualifications of a deceased practitioner, and the only sure and certain test is to consult the Medical Register and there identify the purchaser.

New Inventions.

A NEW ANÆSTHETIC MASK.

The usual pattern of the Schimmelbusch mask appears to me to have two defects: (1) The handle is made at the wrong end—i.e, the upper, or nasal, end—so that if the anæsthetist holds the handle of the mask in one hand and a drop bottle in the other he cannot control the patient's jaw at all readily. (2) The handle itself is a small piece of plain metal, which must be tightly gripped between the thumb and



one or more fingers to hold it in position, leaving the ring and little fingers, the least efficient fingers, to support the jaw. To overcome these defects I have had a mask made, shaped to the face, and fitted with a handle at the lower, or chin, end. Further, in place of the ordinary handle I have suggested a ring grip for the fingers, which allows control of the mask without constant apposition of thumb and fingers, permitting greater freedom and less fatigue. The grip may be single or double, but in most cases I think the single ring will suffice. Messrs. Down Bros. have made the mask for me, and have taken great care and trouble in carrying out my suggestions.

Geoffrey Dunderdale, M.D. Lond.
Pietermaritzburg, Natal.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 2, 1924.

THE DECLINE IN TUBERCULOSIS.

TUBERCULOSIS is a department of medicine in which it is notoriously difficult to see the wood for the t.b.'s. The individual worker is all too ready to attribute the reduced mortality from the disease to individual methods in which he is personally interested, while the central observer who studies the epidemiological curve may become sceptical of the value of effort at all. To both of these Dr. A. S. MACNALTY'S comprehensive review of tuberculosis work in England, which appeared at the front of our last issue, may help to bring perspective. Dr. G. LISSANT COX spoke of the organisation of county schemes recently at the Royal Institute of Public Health (THE LANCET, Jan. 26th, p. 213). We leave these reviews to speak for themselves, and turn to the problem as it presents itself in America. In the year 1900, the first year for reliable statistics on tuberculosis for any large part of the United States, the death-rate from this disease was 195 per 100,000 of population. In 1910 it had become 165 for the same geographical area, a drop of 15·6 per cent., and in 1920 it had fallen to 112, or nearly 43 per cent. lower than in 1900. In the experience of some 15 million persons insured in the Industrial Department of the Metropolitan Life Insurance Company, between 1911 and 1921 the death-rate had declined over 49 per cent., a figure even more remarkable than that for the entire population. To the causes and auxiliary conditions which can be regarded as having helped in securing this result, Dr. LOUIS I. DUBLIN has devoted an interesting address, delivered before the American Tuberculosis Association and now reprinted, which has a useful bearing on English experience.

Two explanations are given of this change in the experience of America and of other countries, the first alleging that the change is due primarily to activities within human control, while the second minimises the importance of environmental factors in the control of tuberculosis, and emphasises the all-importance of the genetic—that is, the constitutional factors. Infection is admittedly necessary, but according to the geneticists, the fate of those infected depends on inherited qualities. If the latter view prevails it follows that current anti-tuberculosis activities are relatively unimportant, and that in this matter "natural selection may have done more for racial health than medical science." In analysing the facts bearing on these two views Dr. DUBLIN lumps together all environmental factors, leaving almost undiscussed the question as to the relative value of different measures—e.g., early treatment of the sick, segregation of advanced and bedridden patients, familial and industrial hygiene, improved nutrition, &c., and we may do the same, while expressing the hope that a later effort may be made to associate and evaluate different environmental factors with varying degrees of fall in the tuberculosis death-rate. Meanwhile the broad argument as to the relative value of environmental factors in toto and of genetic influences as developed in Dr. DUBLIN'S address deserves summarisation. How do the extreme variations in the geographical distribution of the death-rate from tuberculosis concord with the genetic view? It is not likely that the people living in Akron (death-rate 47) are inherently more healthy than those in New Haven, Conn. (death-rate 81). So likewise the difference between urban and rural death-rates and between various rural districts cannot be entirely explained on such a hypothesis. A similar remark applies to the local variations in tuberculosis mortality according to age and sex. If genetic influences are preponderant, how does it arise that in the experience of the Metropolitan Company the male death-rate among whites now reaches its maximum at the age of about 42 and is then 477, while the female maximum is at the age of 27 and is 240 per 100,000? The changing relationship of the death-rate in the two sexes with advancing age is difficult to explain except as the result of changing environment.

The racial incidence of tuberculosis is compatible with the view that in the development of this disease an inherited racial immunity plays a part. The experience of exceptionally low mortality from tuberculosis among Russians and Jews and Italians in the United States is regarded by Dr. DUBLIN as supporting the above-stated view, and even more striking evidence as to racial differences has been adduced by Dr. G. E. BUSHNELL and Prof. LYLE CUMMINS. Whether these differences are evidence of the working of natural selection or arise from varying degree of exposure to infection in early life, or whether in the case of the Russian, Jew, and Italian experience they may be attributed partially to the greater amount of fatty food (e.g., olive oil) in their dietaries or to all these factors, cannot be completely decided in the absence of more complete evidence. But even if, as is possible, race bears a part in the result, environment plays its part to colour the racial picture, and in all cases a higher or a lower death-rate is obtainable with various modes and stations of life. The well-known variations in the death-rate from tuberculosis in accordance with economic level, of which a striking example in insurance experience is given by Dr. DUBLIN, and, still more, occupational variations in mortality from tuberculosis, point to the predominant influence of environment. The strongest and most enterprising rural population migrate into towns; but in the English Registrar-General's statement of occupational mortality there are no less than 26 occupational classes which show a mortality from phthisis almost four times as great as farmers. To indoor industries must be attributed this difference in the main, when the special alcoholic industries are excluded, and in producing this result massive infection as well as reduced resistance of the operative plays a chief part. Perhaps the most enlightening portion of Dr. DUBLIN'S review is that showing recent changes in the tuberculosis death-rate. In his insurance experience a reduction approximating 50 per cent. has occurred in 11 years. The greatest decline has occurred where the rates were originally highest and least where the rates were lowest. In America the age-incidence of the disease has changed to a remarkable extent, showing that age-incidence is a fluid phenomenon "responding," to quote his words, "quickly and incisively to external modifications when these are properly chosen and well directed." Compare these changes with the increased tuberculosis death-rate in many European countries, and the picture is consistent far more with the first than with the second of the two explanations—with environmental rather than with genetic influences.

This explanation, furthermore, gives hope for the future and stimulus in the pursuit of all known measures of prevention. The lines of action which have

been most closely associated with the decline already secured have been dual in character. Massive and repeated infection, especially of the young and adolescent, have been rendered less common and their dosage decreased; and many influences, including educational, have combined to produce more cleanly habits of the people, reduction of dust, and other evils in industrial life, and generally improved nutrition of the population. The dissection of the relative value of these and other environmental factors is a task of great complexity for which the data possibly do not exist; and personal differences of opinion as to the importance of each factor meanwhile will persist. But this is of relatively small practical importance if the principle of attack on tuberculosis from every point of view be accepted. It is by combined attack on all lines, carried forward with confidence and perseverance, that we may anticipate ere long, in this country as in America, a general tuberculosis death-rate of 50 per 100,000. This figure has already been attained in New Zealand and in Australia, and Dr. DUBLIN anticipates the attainment of the same figure in the United States by the year 1930.

NATIONAL HEALTH INSURANCE.

THE Court of Inquiry into the remuneration of insurance practitioners, whose deliberations were summarised in our pages last week, reported just after we had gone to press. The award is as follows:—

> The amount of the capitation fee per insured person per annum on the basis of which the Central Practitioners Fund under Article 19 of the National Health Insurance (Medical Benefit) Regulations, 1924, should be calculated as from the 1st January, 1924, so as to afford adequate remuneration for the time and service to be given by general practitioners under the conditions set out in those Regulations in connexion with the medical attendance and treatment of insured persons, due regard being had to the service in fact rendered under the Regulations hitherto in force (such capitation fee not to include any payment in respect of the supply of drugs and appliances nor any payments to meet the special conditions of practice in rural and semi-rural areas), is nine shillings.
>
> In the course of the inquiry it was stated on behalf of the Minister of Health and the Secretary for Scotland, and on behalf of the British Medical Association that our finding was only intended to be binding for the year from the 1st January, 1924, to the 31st December, 1924, but that both parties desired the Court to make a recommendation covering such longer period as we should think fit.
>
> We therefore recommend that the capitation fee of nine shillings so found by us should remain in force for a period of three years from the 31st December, 1924.

Thus the capitation fee regarded by the Court as adequate remuneration for the practitioner's time and service exceeds by 6*d*., or nearly 6 per cent., that offered by the late Minister of Health, and its award fully justifies the appeal by the insurance medical service to an independent tribunal. The Court recommends that the capitation fee now awarded should remain in force until Dec. 31st, 1927, a period which will ensure the tranquillity so desirable for the smooth working of medical benefit under the Insurance Acts. During that period the Royal Commission can inquire without distraction into the conditions under which this medical benefit can best be administered.

It is significant that just at this moment proposals have been made for creating a new system of health insurance in France. These proposals, which were described by our Paris correspondent last week, are as yet not elaborated in detail. French legislation tends to pass laws which are sometimes mere statements of general principles, the details of administration being left to be worked out by regulations made by the executive. Even in Great Britain, where this tendency is not so marked, the law of health insurance is not operated without a vast number of subsidiary regulations, so that no one, for example, could understand the relation of the medical profession to the State system under the National Health Insurance Acts without studying the latest medical benefit regulations. It is therefore not easy to judge of the French project until it reaches the stage at which the executive works out the details. As a matter of principle, however, it may be assumed that the State will not wish to wreck its scheme by estranging the good will of the medical men on whose coöperation its success depends. Remembering our own controversies on this side of the Channel, we shall watch with interest and sympathy the efforts of the *corps médical français* to preserve its independence and to secure a position which shall be safe from the pressure of outside influences. The financial arrangements of any scheme of national health insurance must depend on actuarial information of a kind not always at first available. It is stated that the only information of this sort in France is that acquired by the French mutual benefit societies, but it is doubtful whether the benefits given by those societies are on a scale comparable to those now proposed. The misfortune of the medical profession is that, when such financial arrangements are found to have been based on too optimistic a scale, there is usually an attempt to make a revision of them at the expense of the doctors. The profession, in fact, has to guard itself against three possible perils. First, it must protect itself from being asked to do something foreign to its wishes and traditions; professional confidence must remain sacred; a doctor must not be required to undertake the treatment of an impossible number of patients, nor can he be expected to act as magistrate and policeman towards the malingerer. Secondly, the profession must retain control of professional standards and of disciplinary decisions. Thirdly, the financial arrangements must provide a fair reward for work properly done. To fix a total of administrative cost and then, after various deductions therefrom, to leave the medical profession to an undignified scramble for remuneration out of a fluctuating balance—that is one way and the wrong way. The other way is first to fix the proper remuneration for the necessary professional services and treatment, and then to construct a financial scheme which shall secure the payment of that remuneration irrespective of other considerations. The medical profession in France, with its noble record of public service and of successful research, may be trusted to work the new proposals to the public good.

The new scheme may take a little while to mature. A *projet de loi* brought forward in France suffers many changes before it becomes actual law. Its initiator has much less control over its subsequent form and its progress through the legislature than has a Minister in charge of a Government Bill at Westminster. Two political considerations may perhaps also be mentioned. National health insurance has a German ancestry—a fact which not every nation will regard as a recommendation; and the patriotism which is preparing itself to lift the franc back to its normal exchange value may have to postpone schemes which make a further demand upon the public purse.

THE BETTING HABIT.

THE proposal to put a tax upon betting has drawn attention to the extent to which this form of gambling has become an organised part of social and economic life. Whether there is anything intrinsically wrong in making a bet is capable of vigorous but inconclusive argument; there can be no doubt as to the noxious results of the betting habit. The amount of money passing through the hands of bookmakers is by some people regarded as immaterial as far as the general community is concerned; it is only transferred from one set of pockets to another, but the amount of energy involved in the transfer may well be a matter of public concern. The maintenance of thousands of bookmakers, with their touts and assistants, the output of sporting prints, the postal work involved—in fact, the whole machinery of betting at best forms a luxury trade which in the end can scarcely be to the general advantage. At the worst it is a useless waste, involving continual loss to the class of habitual bettors and frequently leading to disaster and crime. It is a peculiarity of this betting system that the backer of a horse rarely bets with his fellows, but employs the bookmaker as an intermediary. In some countries the totalisator largely replaces the bookmaker, and a known percentage of the amount passing through the machine is deducted before the remainder is divided amongst the successful backers. In either case the result is a steady depletion of the funds of the habitual bettor. This being so, backing horses as a means of making money should not appeal to those accustomed to close reasoning, and yet it may be observed that a large amount of mental effort is spent by quite intelligent people in studying, pencil and paper in hand, that quality called "form" in an attempt to "defeat the bookies." The bookmaker, meanwhile, if he knows his trade, is invincible, and the only person defeated is the student of form or someone else pursuing an equally unreliable scheme for outwitting arithmetic.

The man who makes a casual bet or takes a share in a sweepstake presents no problem; that the breeder or trainer of racehorses, and those immediately connected with the industry, should make wagers seems a part of the business, though there are exceptions occasionally when one hears of people in this industry who never bet; and a visit to a race meeting with an incidental bet or two makes up a comparatively harmless day's recreation. But a feverish interest in betting for its own sake now possesses masses of people, and, since this interest leads only to loss of money and secondary disasters both in the home and in relation to employment, the causes for it must be sought elsewhere than in the sphere of conscious motivation. These causes can only be guessed at, but probably rest upon character traits common to mankind. The thwarted will to power that underlies many neurotic performances may find an outlet in pitting one's judgment against that of others, and the man who offers gratuitous "tips" to friend or stranger—often by the quaint process of writing them upon the wall of a public lavatory—may taste for a moment the sweets of superior knowledge. Pride or conceit, often a compensation for a feeling of inferiority, produces a belief that the individual concerned is not as other men, but can succeed when they fail. If these suggested motives seem too indirect, simpler ones may be sought in the power of example, the desire of getting something for nothing, or the craving for excitement. Whatever motives are suggested, however, frustrated desire appears in most of them. The contented man whose interests are satisfied is no more likely to fall a victim to the betting habit than to alcohol. We must conclude that the physical and spiritual surroundings of many people do not satisfy their needs, and that self-control and common-sense are too weak to withstand the tendency to seek escape from reality in the excitement and fantastic hopes of the gambler. This view accords with the evidence given before the recent Commission showing that the practice is most widespread in those classes where life is most dull. In considering the problem it is plain that we can be guided neither by those who boldly maintain that the desire to gamble is inherent in human nature nor by those who, inspired by the best intentions, would solve it by making betting a crime. The betting habit, like alcoholism, delinquency, and other sociological difficulties, cannot be solved by direct attack upon the symptom.

RESEARCH IN FOOT-AND-MOUTH DISEASE.

WHILE the immediate brunt of the epidemic of epizoötic stomatitis is abating, the desire to take advantage of its lessons is assuming more definite form. In our present issue Dr. J. A. Arkwright, of the Lister Institute, who was in charge of the research work on board ship in 1921, pleads for the faith and courage to set up and maintain a proper experimental station on land. Easy though it would be to leave research to countries where the disease is ever present, Dr. Arkwright points out with great cogency that the problems are not the same for our own country where means should be adapted to the protection of our insular position. Experimental study, already made difficult by the policy of slaughter, has been further impeded by the belief that rodents were immune to the virus. This statement by Löffler and his colleagues has now been set aside, and it has been shown that the virus can be kept active by passage through a series of guinea-pigs. We also print from the Liverpool Bacteriological Department a piece of work of the first importance on infected rats. To this department glands were brought from the carcasses of cows sent to the abattoir as non-infected but having been in contact with cases of foot-and-mouth disease. Prof. J. M. Beattie and Mr. David Pedden fed these glands to rats which developed œdematous swelling of the feet, vesicles between the toes, and patches of gelatinous œdema in the lungs. The special localisation of the lesions is that of the disease in cattle, apart from the condition of the lung, which has apparently not been described before. Should this work, which has analogies with the observations upon guinea-pigs by Waldmann and Pape, be confirmed, an important avenue for investigation is opened up in view of the infected rat as possible carrier of the disease. Moreover, as the authors point out, rats can be easily isolated and the risks of investigation reduced to a minimum. There is no doubt that the Board of Agriculture should consider resumption of the truncated work of 1921.

INDEX TO "THE LANCET," VOL. II., 1923.

THE Index and Title-page to Vol. II., 1923, which was completed with the issue of Dec. 29th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2. Subscribers wishing to receive the Indexes regularly as published should indicate this desire.

Annotations.

"Ne quid nimis."

HOPE FOR THE LEPER.

A FORMAL campaign against leprosy is being inaugurated this week in London. The precise extent of the disease throughout the world is not known with accuracy, although there are probably about 500,000 lepers in India and twice as many in China. The northern section of the New World is comparatively free—Mexico being an unknown quantity—but in the southern republics, colonised from the Iberian Peninsula, only Chili appears to be free, and Colombia, a former centre of slave import, is credited with a high proportion of lepers. Missionaries state that Sao Paulo in Brazil has a higher comparative rate of non-segregated leprosy than any other city in the world. Oceania has some high rates, but Australia is free with the exception of the coastland of tropical and sub-tropical Queensland. Sir Leonard Rogers recently estimated the total leprous population in all countries at 2 million, or 3 million if the early cases are included in the calculation. Fortunately, the effectiveness of the chaulmoogra treatment is opening up great possibilities both for the individual and for the infected neighbourhood. Clinical improvement is by no means rendered void by the fact that pharmacologists have not yet been able to agree as to which of the constituents of chaulmoogra oil it is that possesses therapeutic value. Much still remains to be done in isolating the active ingredients. But the latest advances towards the solution of the problems of leprosy have been chronicled in our columns, and their story warrants the hopeful attitude adopted by the leaders of the new campaign.

Under the British rule, apart from India, leprosy has to be dealt with in the tropical African colonies, in Ceylon, the Malay States, Malta, and Cyprus, and the Imperial responsibility implied has led to the foundation of the British Empire Leprosy Relief Association, with the Prince of Wales as patron, and the Viceroy of India and the Governors-General of Canada, New Zealand, and South Africa as Vice-Presidents. Lord Chelmsford is chairman of the General Committee and Sir Leonard Rogers chairman of the Medical Committee. The aims of the Association are:

(1) To help all lepers in the Empire by providing the latest treatment for all, and houses for those who are homeless and destitute.

(2) To supply the latest medical information and the most improved drugs to leper institutions, settlements, and hospital clinics; and to train those in charge of lepers in applying the treatment efficiently.

(3) To support sound schemes of segregation, with the best treatment, in countries where large numbers of lepers ought thus to be dealt with.

(4) To collect information and statistics and to issue bulletins of information and advice to all working amongst lepers.

(5) To support further researches on both the ætiology and treatment of leprosy, with a view to discovering more efficient methods of prevention, and to further simplify, shorten, and cheapen the curative measures.

The movement is being formally launched at a Mansion House meeting as we go to press, where the speakers include Lord Chelmsford, Sir Humphry Rolleston, and Sir Leonard Rogers. The appeal should meet with a ready response in the light of the assurance given by Dr. E. Muir, working at the School of Tropical Medicine in Calcutta, who is able to state his belief that in all early cases the arrest and retrocession of the disease, up to a relative cure, may be expected if diet, exercise, and general sanitary conditions are favourable, and if the chaulmoogra treatment is continued for a sufficiently long period of time. In one of the large Indian asylums the mortality has already been reduced to one-fifth of its former rate. Reports in the quarterly magazine of the Mission to Lepers repeatedly mention the special treatment and the new atmosphere which its application is bringing into leper colonies.

THE TREATMENT OF INCOMPLETE FEBRILE ABORTION.

SOME recent papers, contributing statistical evidence on behalf of the conservative, expectant treatment of incomplete febrile abortion, would suggest that the superiority of this course over the routine immediate evacuation of the uterus was established. But as recently as 1922 the well-known German gynæcologist, Prof. A. Döderlein,[1] of Munich, expressed himself as follows: "I regard it as a fatal heresy to recommend expectant treatment in febrile abortions." Prof. Döderlein's views, it may be remembered, were those of unchallenged orthodoxy less than a generation ago, and when Prof. G. Winter, of Königsberg, ventured to plead for expectant rather than active treatment some score of years ago the opposition he encountered was formidable. He has, however, repeatedly returned to the charge, and in his most recent publication [2] he is supported by an impressive show of statistics. He finds that this controversy has yielded 267 original articles, dealing with about 24,000 febrile abortions. Among 276 cases treated on expectant lines there were 178, or 64·5 per cent., in which abortion was terminated spontaneously. It was also found that among 6512 cases of abortion treated by digital evacuation the mortality was 2·9 per cent., whereas among 1048 cases in which abortion was completed spontaneously the mortality was only 1 per cent. Prof. Winter thinks bacteriologically in this matter, and he has come to the conclusion that the fate of the patient largely depends on the nature of the infecting organism. He has collected the 2080 cases reported by 21 observers publishing their bacteriological findings, and he has found that the mortality ranges from 7·3 per cent to 20·8 per cent., according to the nature of the infecting organism, hæmolytic streptococci being the most toxic. He suggests that, whenever it is possible, a bacteriological examination should be made of the vagina, and that when hæmolytic streptococci are found no attempt should be made to evacuate the uterus till they have disappeared. In the absence of a bacteriological examination he urges that evacuation of the uterus in the febrile stage of an abortion should not be attempted forthwith, and when expectant treatment is not followed by the spontaneous expulsion of the ovum evacuation of the uterus should be with a blunt curette rather than with a finger.

Prof. Winter has had many followers, one of the earliest being Dr. Emil Bovin, of Stockholm. His last paper [3] on this subject contains a statistical analysis of the 1141 cases of incomplete febrile abortion treated at his hospital up to Dec. 31st, 1922. Though the period under review included the pandemics of influenza and the deprivations of the late war, he had to record only 24 deaths (2·1 per cent.). In 623 cases the abortion was completed spontaneously, the mortality being only 1·3 per cent. Among the 518 cases in which expectant treatment had to be given up and evacuation of the uterus performed there were 15 deaths, or a mortality of 2·9 per cent. There were considerable differences in the results according as evacuation was performed during, or some time after, the febrile stage; the mortality was 1·9 per cent. in the latter class, and as great as 8 per cent. in the former. Like Prof. Winter, Dr. Bovin has found that giving quinine frequently by the mouth for a few days favours the spontaneous completion of an abortion. During the three years 1920–22 expectant treatment alone was successful in 241 out of 366 cases of febrile abortion (65·8 per cent.), partly, at any rate, owing to the use of quinine. However conflicting opinions may be as to the best course to pursue in the treatment of incomplete febrile abortions, there seems to be little doubt that most of them represent criminal acts. It is, of course, often difficult to obtain reliable information on this point; much depends on the desire and ability of practitioners to elicit information from their patients. In this connexion Dr. Bovin refers to investigations published

[1] Deut. med. Woch., Jan. 5th, 1922.
[2] Ibid., Dec. 21st, 1923. [3] Hygica, Dec. 31st, 1923.

in 1922 by Dr. Richter, of the Swedish Allm. Barnbördhuset. Among the 107 women admitted to hospital between September, 1920, and April, 1921, suffering from febrile abortion and a temperature exceeding 38° C. there was not one who failed to admit that criminal abortion had been attempted.

THE PREVENTION OF STREET ACCIDENTS.

STATE medicine is a wider subject than public health, for it has its forensic as well as its preventive side; but neither of these titles in their ordinary acceptation in this country comprises the prevention of accidents from machinery or from traffic or otherwise. Thus outside the sphere of activities of local sanitary authorities and county councils—and never hitherto proposed to come within the control of the central Ministry of Health—there lies preventive work of great public importance, by the execution of which much loss of life and many minor injuries might be obviated. Of such work the prevention of accidents forms a most important part. Its importance is brought home to us by a valuable report of the American National Safety Council on "The Warning of Public Accident Statistics." The work of this Council illustrates to how great an extent in the States important public health functions are being carried out by voluntary associations. It is not surprising to find that large accident and life insurance societies and traffic engineers of railways and large industries form the Accident Statistics Committee of the Public Health Section of this National Safety Council.

The statistics displayed by them are startling. In 1922 there occurred 75,300 fatal accidents in the United States; the number would have been 35,000 to 40,000 fewer if they had occurred on a scale according with the experience of England. Of this number the automobile was the chief cause of fatal accidental injury, and accounted for 18 per cent. of the total accident budget. This increase is the more noteworthy in view of the fact that the automobile death-rate was 24·0 in 1915 and 11·6 in 1922 per 10,000 automobiles registered. The regulation of automobile traffic has improved, but the mass of destruction of life has nevertheless augmented. It is noteworthy, further, that the automobile death-rate per 10,000 automobiles registered varied from 2·98 in Chicago, 2·90 in New York, and 1·05 in Los Angeles to 0·47 in Salt Lake City. The question remains as to whether the blame for these great variations in death-rate is due to carelessness of pedestrians or of chauffeurs, or to variations in the permeability of streets and the regulation of traffic. The report in hand does not profess to answer these important questions in detail, but it gives most valuable information throwing light on them; and it serves, further, as a remarkably excellent example of the fact that statistics carefully collected and intelligently analysed may give a valuable lead on problems of life-saving. In the cities for which statistics are given children under 15 years of age formed on an average 37 per cent. of the persons killed. In the city of New York they formed 50 per cent. These figures clearly indicate that it is not merely additional precautions on the part of the pedestrian that are needed, but that additional safeguards are called for to protect him. The Committee lays stress on the importance of traffic movement studies in showing how to diminish automobile fatalities. The first essential is the preparation for each town of a "traffic-artery" map, which usually would show possibilities of diversion of traffic on a considerable scale. The Committee's definite conclusion is that in most cities traffic congestion is due to the ineffective use of street areas rather than to the lack of them. We wonder whether even in London the police authorities could show that the present deplorable amount of traffic congestion is not capable of being materially reduced by application of this axiomatic statement. The next point which is stressed is the importance of each city maintaining spot-maps of traffic accident occurrence, by means of which an approach might be made to a determination whether the troublesome nature of the road itself or the lack of traffic discipline is more to blame. Such spot-maps form the first line of guidance in control and diversion of congested traffic.

We have merely indicated a few of the many important points comprised in this valuable report, which should be studied by all interested in this problem. The prevention of accidents, especially now that automobile accidents are becoming increasingly a serious cause of death, is of interest to all medical men; the proper control of traffic and the reduction of congestion at certain points concerns them as busy messengers of health intent on carrying out their mission in life.

A NEW TEST FOR TYPHOID FEVER.

Dr. E. Moretti,[1] of the Ospedale Maggiore, Milan, has devised the following modification of Petzetakis's iodine reaction for the diagnosis of typhoid fever. 25 c.cm. of urine are saturated with 20 g. of crystallised ammonium sulphate. After about a quarter of an hour the urine is filtered and diluted to about a third if it is too thick. To 10 c.cm. of the filtrate one-fifth of its volume of a 10 per cent. solution of sodium hydrate is added, and then a drop of a 5 per cent. tincture of iodine. The solution is then shaken, and if the reaction is positive a persistent golden-yellow colour is produced. Out of 100 cases of typhoid fever in which this test was tried, it was positive in 95 and negative in only 5, which were remarkably mild cases in which the temperature became normal at the beginning of the third week. In two cases of paratyphoid A the reaction was negative, while it was positive in two out of three cases of paratyphoid B. In the great majority of all the typhoid cases the reaction was positive in the first week, and very frequently during the first few days of the disease. The intensity of the reaction increased until the disease reached its height and then gradually decreased as the symptoms subsided, the reaction becoming negative before the temperature reached normal. The reaction was also invariably positive in pulmonary tuberculosis with cavity formation, very frequently (80 per cent.) positive in cases in the second stage, and occasionally (20 per cent.) positive in the first stage. It was often positive during the height of pneumonia and measles, and always negative in malaria and acute rheumatism. The iodine reaction is thus positive in the same diseases as the diazo-reaction, and like it is an expression of an increased elimination of urochromogen. It is of greater diagnostic value than the diazo-reaction owing to its earlier appearance, greater constancy, and longer duration. In Dr. Moretti's cases the diazo-reaction was positive in only 78 per cent., and, as a rule, did not become so until the first half of the second week.

THE HISTORY OF PERCUSSION AND AUSCULTATION.

IN another column we publish an abstract of an address delivered by Sir William Hale-White before the Midland Medical Society upon the History of Auscultation and Percussion. Broadly speaking, we may say that these methods of diagnosis did not come into use until the beginning of the nineteenth century, and, though Hippocrates knew the succussion splash, until the discovery of the X rays in 1895 auscultation and percussion remained the sole means by which the physician could form any opinion as to the conditions existing within the chest, other than the nature of the sputum. It is easy to be wise after the event, and when we read the treatises of Auenbrugger and Laënnec to say "Why did no one think of this before?" Auenbrugger was born in 1722 and Laënnec died in 1826. For nearly the whole of these hundred years Europe was convulsed by wars, and there was no soldier who beat the ground with a

[1] Riforma Medica, Nov. 19th, 1923.

musket-butt to ascertain the presence of a cavity which might be a mine, or who, in the same way, knocked a cask to ascertain whether it were full or empty, or partially so, or who listened with his ear to the ground for the approach of cavalry, or to hear the scraping of a shovel or a pick by approaching miners, who was not practising and profiting by auscultation and percussion. Some army surgeons of the time must have seen these practices or even have taken part in them themselves, and yet to none did it occur that if a partially filled cask gave a different note above the level of the fluid, to that which it did below, the same law would hold good for the presence of fluid in the chest; or that if the scraping of a pick or shovel could be heard, the scraping of two roughened surfaces within the chest could also be heard. Until the advent of the two men who had ears to hear the medical profession made no use of what in other fields of activity was common knowledge. Both the treatises of Auenbrugger [1] and Laënnec,[2] the latter with biographical notes by Sir William Hale-White have been recently reprinted, and rendered accessible to English readers.

A SYLLABUS FOR SCHOOL SCIENCE.

HARDLY anyone is satisfied with the present state of science teaching in schools, and the recent attempt by the General Medical Council to push chemistry and physics back into the school period has made the questions involved of more immediate professional interest. The difficulty seems to be this. Schoolboys are too immature to get any real advantage from the natural sciences, as ordinarily taught, because they cannot apprehend the generalisations which alone give the subjects as such any real meaning, and the common discipline of experiment, observation, and verification thereby becomes a barren and uneducative toil. Biology seems in a distinctly better position than chemistry because its general ideas are not difficult for young people to grasp, but as a matter of fact biology is much less, and possibly worse, taught in schools than the other subjects. Those who have taught science in schools have tried to apply the methods suitable for university students with the addition of as much water as they deem necessary, and the result is so mawkish and unsatisfactory that many college teachers have expressed their preference for boys who have not "done stinks" at school. As a leading article in *Nature* (Jan. 26th, p. 113) points out, the vicious circle is completed by the fact that the precise scope and mode of school science are really determined by those of the matriculation examinations imposed by the universities.

The writer in *Nature* makes out a strong case for the substitution of "general science" for the formal procedures which obtain at present—for a course, that is, which will give the schoolboy some idea of how the world works and which will whet the appetites of a certain number to go on further and deeper when they have the chance. And being constructive as well as critical he sets out a guiding syllabus for such a course taken from the Book of Wisdom:—

> Knowledge of the things that are, namely, to know how the world was made, and the operation of the elements.
> The beginning, ending, and midst of the times; the alterations of the turning of the sun, and the change of seasons.
> The circuits of years and the positions of stars.
> The natures of living creatures, and the furies of wild beasts; the violence of winds, and the reasonings of men; the diversities of plants, and the virtues of roots.

Even the wisdom of Solomon is not fool-proof, and there are loopholes here for the naughtiness of the astronomer who wants to make his subject a peg for computation, and of the botanist whose chief interest in a root is to know when it is not a root. But something of this kind in good hands would surely lay a more satisfactory foundation for medical education than the present imitation of grown-up knowledge. The experiments in teaching such general science which have been made in America, and the text-books which have been produced there, seem clearly to show the possibility. One danger alone is obvious, and that is a very real one: there must be no idea that "general science" is a royal road to knowledge. Properly used it hardly arrives at knowledge at all; it is a sort of map on which the student may see what places exist and get some indication of how to get there. Like more earthly maps, it will encourage dreams of happy journeys.

[1] Leopold Auenbrugger's Inventum Novum, THE LANCET, 1923, i., 84. [2] THE LANCET, 1923, i., 1270.

GEOGRAPHICAL DISTRIBUTION OF PROSTATIC HYPERTROPHY.

Dr. E. Pfister,[1] of Dresden, remarks that while geographical differences have long been recognised in regard to other urological diseases such as calculus the literature on the geographical distribution of prostatic hypertrophy is very meagre. Most of the data have been derived from warm countries only such as Egypt, Japan, Southern China, India, and the Philippine Islands. The experience of Dr. Pfister, who was for many years physician at the Deaconess Hospital at Cairo, agrees with that of other surgeons who have practised in Egypt, that hypertrophy of the prostate is much rarer in that country than in Europe. Kitagawa and Takagi, whose observations were based on post-mortem studies and not merely on clinical examination, reported similar results in Japan. Hypertrophy of the prostate appears to be less prevalent in the Philippines than elsewhere, as Dill had never observed a case in the large number of patients at the Philippine General Hospital at Manila. J. O. Thomson states that the condition is rare in Southern China, and according to Kenneth M. Walker it is infrequent among the inhabitants of India. Buschan and Ruge have found that it is also rare among negroes in whom, as Dr Pfister had shown in 1913, calculus is also uncommon. On the other hand, it is noteworthy that in the Tirol, where goitre is endemic, hypertrophy of the prostate is frequent. This association finds its analogy in dogs in which hypertrophy of the prostate is often accompanied by goitre. In any case inflammation does not appear to be causally connected with enlargement of the prostate, as gonorrhœa is exceedingly prevalent in those countries in which hypertrophy of the prostate is rare, and in Egypt, where bilharzia frequently causes inflammation of the prostate, hypertrophy of the organ is very uncommon.

[1] Urological and Cutaneous Review, December, 1923.

THE RÔLE OF THE SPLEEN IN THE PRODUCTION OF IMMUNITY.

FROM many sides evidence accumulates of a new movement amongst those workers in physiological and pathological fields whose chief interests are concerned with problems of immunity. The rich promises of the epoch which began with Pasteur have not been in every respect fulfilled, the brilliant results of the discovery of the development of antibodies after the inoculation of some micro-organisms must be set off against the disappointments which have followed the most painstaking endeavours to secure immunity in the case of certain other infections. Impressed by such failures there is a growing group of workers who are seeking to elucidate immunological problems from a different point of view. An example of such work is to be found in the paper by Dr. Ivan I. Manoukhin which was published in THE LANCET of Jan. 26th. In this article the author records the remarkable successful results he has obtained by the application of X rays to the enlarged spleens of a large number of cases of chronic malaria. The cases treated included tertian, quartan, pernicious, and mixed infections and the results appear to have been remarkably successful. Dr. Manoukhin is at pains to emphasise that his successes have been especially in that group of cases in which induration and fibrosis of the spleen were least marked, an effect which he explains on the basis of a theory that irradiation of the spleen

stimulates what he terms the "leucocytolytic" properties of that organ. Without dwelling further on what must admittedly be at present an hypothesis not yet fully proven, we would direct the attention of our readers to this work as evidence of those still obscure relations of the spleen to immunological processes. It must surely be true that future developments will bring new and useful information from inquiries of this nature. As a further example of current work pointing in a similar direction we may quote a recent paper[1] by W. S. Lazarus-Barlow and R. H. Parry, who showed that the introduction of grafts of Jensen's rat sarcoma into the splenic tissue of rats produced a higher general resistance to subsequent subcutaneous inoculation with the tumour than if immunisation were attempted by intracranial or subcutaneous introduction in the first place. They further showed that intrasplenic inoculation definitely retarded the growth of an established subcutaneous tumour in the rat, even though actual disappearance of the tumour was not achieved. These facts cannot, we believe, be fully explained by any existing theories of splenic function; that they are still inexplicable is not the least promising feature in these interesting observations.

THE SLIT-LAMP IN OPHTHALMOLOGY.

SOME years ago Dr. Gulstrand, a Swedish ophthalmologist, invented a new method of illuminating the anterior parts of the living eye, by means of which, combined with a binocular (so-called) corneal microscope, it is possible to observe structures which by the methods hitherto in ordinary use cannot be seen. The apparatus consists of a strong light focused on any desired part of the eye by a system of lenses through an adjustable slit, producing a prism-shaped area of illumination which, viewed with a binocular magnifier of about 24 diameters by the dark-adapted eyes of an observer, displays such objects as the nerve fibres in the cornea or the blood corpuscles circulating in the corneal vessels. The apparatus is somewhat expensive; its routine employment in the consulting-room would materially add to the time necessary for examining a patient, and to acquire facility in its use requires about as much practice as that necessary to become at home with the use of the ophthalmoscope. Nevertheless, its importance as an aid to scientific diagnosis is great, and it is believed by some that its introduction will mark a new era in ophthalmology, comparable to that opened by the invention of the ophthalmoscope itself. In the December number of the *British Journal of Ophthalmology*, Mr. Harrison Butler gives an account of a special week's course on the subject, held at the University Eye Clinic at Zurich by Prof. Alfred Vogt, who has also published an atlas of slit-lamp microscopy. It can hardly be expected that the practical clinical discoveries from the new method can be very striking as yet, but Vogt claims that the earliest clinical sign of sympathetic ophthalmia is the appearance of clusters of cells in the aqueous which can only be seen by this method. Perhaps the most promising field of discovery is the lens, a complete section of which can be illuminated by this method, displaying the exact localisation of opacities. So far English ophthalmologists have been somewhat behind their continental colleagues in taking up this subject, but the interest shown in the method at the meeting of the Ophthalmological Section of the Royal Society of Medicine, reported on p. 231, is encouraging. At this meeting drawings of the appearances seen were shown by Mr. Butler and by Mr. Basil Graves, a Lang Research Scholar. For examining the fundus of the eye the slit-lamp is only available when combined with a contact lens which abolishes the refraction of the cornea, a method which has been worked out by the German ophthalmologist Koeppe, who employs a linear magnification of 80,[2] but which is not practicable at present for every-day clinical work.

[1] Brit. Jour. Exp. Path., 1923, iv., 247.
[2] See THE LANCET, 1920, ii., 1310.

THE CONTROL OF TUBERCULIN.

WHATEVER other effect, for good or for evil, tuberculin may produce when injected into the human or animal body, it certainly does produce tolerance of itself. In the case of the human subject patients have received as much as 1 c.cm. or more of Koch's old tuberculin week by week for months or years without perceptible reaction, and in the case of cattle this tuberculin tolerance has been put to improper use. Pedigree cattle are not allowed to enter many countries unless they have passed a tuberculin test to prove their freedom from tuberculous infection; unscrupulous dealers are known to have given preliminary tuberculin injections to infected cattle in order that they may successfully pass the test. The manœuvre has also been tried in order to outwit a stock owner who rightly insists on the test being applied prior to purchase. At the present moment this fraudulent procedure can only be countered by prescribing a period of isolation and quarantine prior to the official application of the tuberculin test. The evil has attained sufficient importance to justify the Federation of Medical and Allied Services in taking action. A resolution was submitted to the Medical Council of the Federation last Tuesday by Prof. F. Hobday, on behalf of the Veterinary Medical Association, to the effect "That the sale of tuberculin and its use for diagnostic or medicinal purposes shall be restricted to members of the medical and veterinary professions." The demand for legislation to bring the sale and use of tuberculin under Government control is supported by the Agricultural Committees of County Councils throughout Great Britain as well as by the National Veterinary Association, but is opposed by the National Farmers' Union. It is felt that the control of tuberculin is the keystone of the whole edifice of the Milk and Dairies Act, for in controlling tuberculin the most dangerous and most frequent contamination to which milk is subject could also be controlled. Under the Coal Mines Act mallein can only be used under strict supervision, and glanders has practically been eliminated in this country. The legislation suggested by the Federation, by doing away with misuse of the tuberculin test, would be a step towards eliminating tuberculosis in cattle and obtaining a tubercle-free milk supply.

AN UNUSUAL CASE OF STREPTOCOCCAL SEPTICÆMIA.

AT a recent meeting of the Medical Society of the Paris Hospitals MM. Cain and Oury[1] reported a case of fatal streptococcal septicæmia in a man aged 32, in whom the lesions were strictly localised in the veins of the right upper arm and left deep femoral vein, and presented all degrees of severity—viz., suppurative phlebitis with periphlebitic abscess on the one hand and more or less old-standing and organised phlebitis on the other. In contrast with the severity and variety of the venous lesions was the normal condition of the heart, liver, and kidneys in spite of the profound intoxication. Histological examination confirmed the clinical findings. The streptococcus had not formed any colonies in the viscera, but was found in them only in the form of emboli, which had not produced any reaction in the neighbouring tissues, and had probably only occurred at the moment of death. The phlebitis constituted the whole disease, and the condition was one of acute venous septicæmia without a known portal of entry, being caused by a streptococcus of attenuated virulence, as was shown by absence of deep lesions in the organs and lack of virulence for animals. Death, which took place after about a month's illness, was due to broncho-pneumonia. Only a few similar cases have been recorded. Renault and Lévy in 1912 reported a case of streptococcal infection with localisation in the veins and small joints which ended

[1] Bulletins et Mémoires de la Société Médicale des Hôpitaux de Paris, Dec. 13th, 1923.

in recovery, and Roux in 1919 published a fatal case of prolonged septicæmia, which ran its course in two stages, the first being one of subacute and the second of acute venous septicæmia. The streptococcus is not the only organism which may give rise to primary venous localisations. The typhoid bacillus may produce similar symptoms, as was illustrated by three cases recently reported by Etienne.

THE PATHOLOGY OF ANAPHYLAXIS.

THE symptoms and pathology of anaphylactic shock differ a great deal in different animals. The classical guinea-pig reaction, in which bronchiolar spasm often leads to death by asphyxia, is quite exceptional. There are reasons for thinking that the reaction in the dog is fairly similar to what happens in man. Fatal human cases are quite rare, and have generally not been at all fully investigated. We welcome, therefore, the careful study of anaphylactic shock in the dog, which Prof. H. R. Dean and Dr. R. A. Webb contribute in three papers in the current number of the *Journal of Pathology and Bacteriology* (pp. 51–94), the other contents of which are summarised on p. 237. Dogs, like men, are rather insensitive. A certain number show no symptoms on receiving the second dose of foreign protein (in this case horse serum), and only a small proportion die. Symptoms of shock, if present at all, come on at once; the animal vomits and lies down with general muscular relaxation. This does not often last more than half an hour, after which signs of recovery are seen. Recovery may be permanent, or a second period of collapse with great weakness and stupor may supervene, which may end in death or last for several hours, after which the animal slowly recovers. The most obvious anatomical change observed is an extreme congestion of the liver and gall-bladder. The liver swells very much and becomes deep purple, the engorgement being due to a distension of the sinusoids with hæmorrhage between the liver-cells; in severe cases the liver-cells themselves show degenerative changes and necrosis of extraordinarily rapid onset. In more than half the animals cardiac hæmorrhages were found, which in several instances involved a branch of the auriculo-ventricular bundle, but there is no evidence that these contributed to the symptoms or the fatal result. In a few instances hyper-distension of the lung alveoli was found with hæmorrhage; in the other organs no gross changes were observed. The changes in the blood were worked out in considerable detail. In both normal and sensitised animals an intravenous injection of horse serum leads to a temporary concentration of the blood. In sensitised animals this is followed by a much greater and more lasting rise in the red corpuscles per cubic millimetre and the percentage of hæmoglobin, due, doubtless, to the passage of plasma into the tissue spaces, and accompanied, curiously enough, by a fall in the colour index and the appearance of large numbers of nucleated red cells in the peripheral blood. Simultaneously with the onset of shock the blood everywhere becomes extremely venous, and this continues in spite of vigorous artificial pulmonary ventilation. The mechanism of this is quite obscure, unless it be an obstruction to the exchange of gases in the lungs by an exudation of plasma into the walls of the alveoli, but the authors attribute to the defective oxygenation of the central nervous system a main share in the production of the lasting and sometimes fatal symptoms. The immediate symptoms are caused by a fall of blood pressure, largely due to the loss of effective circulating blood in the liver. Another blood change, better known from previous work, is the leucopenia which follows immediately after the serum injection and lasts half an hour or so, to be succeeded by a marked leucocytosis. An exemplary analysis of the phenomenon shows that it is due to the polynuclear cells being caught in the lung capillaries.

PNEUMOCOCCAL INFECTION WITHOUT PNEUMONIA.

AT a recent discussion of the Manchester Pathological Society the view was expressed[1] that lung infection with the pneumococcus of pneumonia is an air-borne infection and not blood-borne. Experimental proof of this view is afforded by the occurrence of cases in which there is a prolonged, and often severe, infection of the blood, involving close contact between the lungs and the infecting pneumococcus and yet pneumonia does not occur. Such a case has been recorded by Dr. A. R. Felty and Dr. C. S. Keefer,[2] of the Biological Division of the Medical Clinic, Johns Hopkins University and Hospital, who preface their account of it by stating that while the pneumococcus is frequently found in the blood stream during lobar pneumonia, as is shown by the fact that 25 per cent. of Cole's cases gave positive cultures, pneumococcæmia in the absence of a primary pneumonia, with or without subsequent involvement of the lungs, meninges, endocardium, or joints, is much less common. They record an illustrative case in a previously healthy woman aged 22, who suddenly developed severe constitutional symptoms of a general infection without at first presenting any signs of a localised focus. Repeated physical and X ray examination of the chest failed to show any evidence of a pneumonic process, but a generalised blood infection by Type 1 pneumococcus was demonstrated, and its source was determined by cultivation of the purulent discharge from the posterior pharynx and ethmoid cells. On active treatment of the local infection and specific serumtherapy rapid recovery took place. The writers allude to similar cases of primary pneumococcus infection, some of which have run a mild course like their own, while others have ended fatally, and lasted as long as one or two months simulating at first typhoid fever. When metastases did not occur in the joints, lungs, endocardium, or meninges the outcome was usually favourable. In conclusion, the writers emphasise the frequency of a focus of infection in one or more of the paranasal sinuses in these cases of pneumococcal sepsis, and allude to the investigations of Darling who found in a series of necropsies on all types of pneumococcal infections that 92 per cent. showed pneumococcus inflammation of the paranasal sinuses, and four out of five patients with pneumococcal sepsis had pneumococcal sinusitis. This case bears out, in the human subject, the experimental results obtained in monkeys, animals susceptible to pneumonia, in which the introduction of pneumococci into the air-passages causes pneumonia, while their injection into the blood-stream, or subcutaneous tissue, produces a general septicæmia without lung involvement.

[1] THE LANCET, Jan. 5th, p. 25, and Jan. 12th, p. 87.
[2] Journal of the American Medical Association, Nov. 10th, 1923.

NOTIFIED INFECTIOUS DISEASES.—During the week ended Saturday, Jan. 19th, there were notified to sanitary authorities in England and Wales the following cases of the commoner infectious diseases: scarlet fever 1501, diphtheria 792, enteric 17, pneumonia 1220; and of the less frequent diseases: puerperal fever 45, cerebro-spinal fever 9, acute poliomyelitis 8, acute polio-encephalitis 1, encephalitis lethargica 18, continued fever 1, dysentery 8. Of small-pox 77 cases were notified from the following areas: Derbyshire 26 (Bolsover 2, Chesterfield 8, Ilkeston 2, Swadlincote 5, Blackwell R.D. 4, Clowne R.D. 1, Shardlow R.D. 4); Durham 1 (Chester-le-Street); Gloucestershire 15 (East Dean R.D.); Leicester 6 (Ashby-Woulds); Notts 27 (Hucknall 10, Kirkby-in-Ashfield 15, Stapleford R.D. 2); Yorks, West Riding 2 (Adwick-le-Street 1, Bolton-upon-Dearne 1). Groups of cases of ophthalmia neonatorum were notified in the metropolitan boroughs of Battersea, St. Pancras, and Southwark 2 each, in Birkenhead 3, Sunderland 2, Bristol 4, Liverpool 9, Manchester 7, Oldham 2, Willesden 2, Newcastle-upon-Tyne 2, Tynemouth 2, Nottingham 2, Stoke-on-Trent 4, Walsall 2, Cannock 2, Croydon 3, Birmingham 13, Sutton-Coldfield 2, Kingston-upon-Hull 2, Leeds 2, Sheffield 7, and Cardiff 3.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LVI.—SQUINT IN YOUNG CHILDREN.

A SQUINT in a young child is of importance not only on account of its unsightly deformity and its association with errors of refraction and defective vision, but also because it is not infrequently an indication of organic nervous disease. This relationship at once suggests the primary classification of strabismus into two main classes—concomitant and paralytic. They have nothing in common, and it is the first duty of the practitioner to decide to which class the case belongs; for one is within the province of the ophthalmologist, whereas the other is the concern of the neurologist. The differential diagnosis is as a rule easy. In concomitant squint the two eyes move together to the same degree, the angle between them remaining more or less constant, nor is there any limitation of movement. If the eyes be alternately shaded the shaded eyes converge or diverge to the same extent. These children rarely complain of double vision. If, on the other hand, there is a paresis or paralysis of one or more eye muscles, the paralysed eye may show a limitation of movement in one direction. The eyes do not move together to the same degree, and if they be alternately shaded it will be noted that the secondary deviation is greater than the primary. Children suffering from paresis of an eye muscle generally, but not always, complain of diplopia. In doubtful cases the best test for children is that recently brought out by Hess, professor of physiology at Zürich. The apparatus is simple, consisting of a black sheet of cloth about 18 inches by 24 inches. To this are attached nine red wafers about half an inch in diameter, arranged in three parallel rows. The child is given a black rod, at the end of which is a green arrow; a red glass is placed before the fixing eye and a green one before the squinter. The child now sees the red wafers only with the fixing eye, and the green arrow with the squinting eye. We ask him to place the arrow on the wafers beginning at the top one of each row. If there be a paresis of a muscle, say of a lateral rectus, he will succeed in locating the wafers on the side opposite to the paralysed muscle, but he will fall short of the middle rows of wafers, and very far short of the row on the side which brings the weakened muscle into play. This simple test is within the capacity of almost any child, and gives us a definite measure of the amount of loss of function. If the result be charted and the test repeated from time to time, a graphic record of the progress of the case is obtained.

If tests show that there is no actual paresis of a muscle we are dealing with a concomitant strabismus, which may be convergent or divergent. Cases in which the deviation is upward or downward are uncommon; a strongly converging eye may turn up, but the treatment of the convergence includes that of the secondary error.

Concomitant Convergent Strabismus.

This type is far more common among the working-class children than in the upper classes. I have no doubt that heredity exerts a powerful influence in the ætiology of squint. In many cases among those who come to my school clinics one parent squints, and in a much larger proportion brothers and sisters are affected. I see no reason to doubt the view held by Javal, Worth, and others, that the essential cause of squint is hereditary lack of development of a fusion centre in the brain. Many children, examined with the amblyoscope and stereoscope, show no sign of any desire for fusion, and in others the faculty is feeble. It is obvious that if there be no desire for fusion the eyes have no directing force towards any given object. Again, if one eye is better than the other from the visual standpoint, that eye will be used for fixation to the entire neglect of the other, which may not only assume a false position but may deteriorate in function. A child is not born with a fully developed fusion faculty, but when it is six months old it has a fair grade of binocular vision. There are many adults who do not squint but who never can get the solid effect with the stereoscope, and often have difficulty in fusing the images from a field-glass. The deciding and ultimate factor in concomitant converging strabismus is generally hypermetropia, since there is an intimate relationship between accommodation and convergence.

In addition to the lack of fusion faculty and to mal-coördination of the neuromuscular apparatus there may be a mechanical element which helps to maintain a convergent squint. This is especially true of squints of high degree which have persisted for some years, for there is a tendency for the conjunctiva and the capsule of Tenon to develop on the inner aspect of the globe only to the extent demanded by the false position of the eye. This factor probably accounts for the failure of many operations and to counteract it some surgeons perform a plastic operation upon the conjunctiva. Again, the external rectus may be a very feeble attentuated structure or the internal rectus abnormally tight and strong. In this case an advancement alone will fail to correct the convergence, the internal rectus must be attacked.

Age of Onset.—During the first six months of life, when binocular vision is not fully developed, the child often shows occasional strabismus, but after this epoch any malposition of the eyes, especially if constant, should awaken suspicion. In most cases the history is that the child began to converge at about 3 years old, after an illness such as measles and whooping cough. The explanation probably is that the debility caused by the disease weakens the muscle-nerve mechanism which was before only just able to overcome the tendency towards abnormal convergence.

Amblyopia.—Frequently the squinting eye has very poor visual acuity, even after the most accurate correction of errors of refraction. Amblyopia may exist in varying degrees; the acuity of the average amblyopic eye is 6/60ths. In some cases it is congenital and may or may not be accompanied by strabismus, but mostly it is acquired, the so-called "*amblyopia ex anopsia.*" The explanation is that the child rather than see double has suppressed the image from the errant eye, and constant suppression has resulted in loss of function. Amblyopia develops rapidly in children under 3 years old and it is this complication which makes early treatment essential.

Non-operative Treatment.

There is a strong tendency towards spontaneous cure in concomitant convergent strabismus; probably the majority of squints disappear without treatment. Unfortunately, in many cases the eye "dies cured"—hopelessly amblyopic. Our methods must aim at the prevention and cure of amblyopia and the correction of the deformity. As soon as a baby is seen to have developed a permanent or even frequent squint treatment must begin. The first step in all cases is a careful estimation and correction of any error of refraction. The spectacles which correct the hypermetropia must be worn constantly. In a young child it may be difficult to determine the amount of vision in each eye. In such, if the strabismus is confined to one eye, I assume that this eye is amblyopic and occlude the other eye till the squint alternates from one eye to the other. As soon as I obtain alternation I assume that the eye is not amblyopic and give up occlusion, only to return to it if the strabismus shows any tendency to favour one eye above its fellow. Occlusion must be complete so as to exclude light. Merely to place a blank before the fixing eye is useless. The best way is to sew a pad of Gamgee tissue inside the spectacles, but if this be not sufficient to close the eye, then strapping must be used. As soon as alternation appears it is sometimes useful to put a little atropine ointment into the better eye on alternate days. Babies wear special spectacles

with short sides tied behind the head with ribbon. No child is too young to wear a correction for hypermetropia if he be a squinter, in fact it is criminal to neglect a case in this stage when we have the best conditions for preventing the onset of amblyopia. Older amblyopic children are handled in the same manner, but after 5 years of age the prospects of cure are much less and treatment often fails.

Can we do anything to educate a defective fusion sense? Much has been written and little done in this direction. The main difficulty is that the education must commence early, not later than 3 years old in most cases, and the process at such a tender age is intensely difficult, and demands more patience on the side of both parents and children than we can usually command. The methods employed are outside the scope of this paper. The results from fusion training are very disappointing, success infrequent, and often transitory. Probably those patients who regain fusion would have done so without the training after their visual acuity had been improved by spectacles.

Operation for Squint.

When a squinter has received treatment, for some years in the case of moderate degrees, and for at least a year in any case, operation will have to be considered. I find that the most suitable age for operation is 8. It is generally fairly easy to operate upon a child of 8 under local anæsthesia. Younger children are apt to be troublesome, and older ones still more so. All depends upon temperament and early home training. For the majority I find that a general anæsthetic is not necessary, it adds to the difficulties, and makes it impossible to judge the primary effect of the operation. I instil a few drops of cocaine and then inject a few minims of codrenine or novocaine with adrenalin under the conjunctiva over the muscles to be treated. This gives a painless operation if care be taken not to drag on the muscles with the squint hook.

There is great difference of opinion as to the best operation for squint. In any case, simple tenotomy of the internus should be avoided. It is unscientific and uncertain, and in many cases is followed by weakness of the converging act, and not infrequently by actual divergence of the eye. My own practice is to perform recession of the median rectus and advancement of the lateral. In recession the muscle is separated from its insertion into the globe and sutured to the sclera about 5 mm. further back. In advancement the rectus is separated from its insertion and re-attached to the limbal region.

The results of squint operations judged without optimism are not wholly satisfactory. It is very difficult to get a firm grip for the advancement sutures and not infrequently they cut out on about the third day and the muscle slips back to its old position. Probably about 50 per cent. are completely successful, another 30 per cent. good, leaving about 20 per cent. of poor or bad results. There is a tendency for the completely successful cases to diverge slightly in the course of years, whereas those in which there is a residual squint of about five degrees become parallel. The failures can be dealt with after a reasonable interval by re-operation. I think it a mistake to operate upon both eyes at one sitting. I would rather treat a squint by advancement and recession on one eye than by advancement of both external recti.

Concomitant Divergent Strabismus.

This is not nearly so common in children as the converging variety. When present in young children it is generally of the variety known as neuropathic. It is congenital and associated with complete lack of fusion sense. The only treatment is operation when the divergence becomes unsightly. Older children may suffer from a divergence due to myopia which is cured by the use of appropriate glasses. A blind eye or one with very poor vision often diverges, taking the axis of the orbit, which is, in a sense, the natural position for an eye which is not guided by vision.

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Special Articles.

THE PRESENT PROBLEM OF FOOT-AND-MOUTH DISEASE IN ENGLAND.

By J. A. Arkwright, M.D. Camb., F.R.C.P. Lond.

(*From the Lister Institute, Chelsea.*)

That the problem of foot-and-mouth disease is not one that is likely to be easily or quickly solved is evident from the large amount of careful experimental work which has been already done on the subject during the last 25 years. In 1898 Loeffler and Frosch began their long series of observations which have been carried on by them and their successors almost continuously since, on the nature of the virus and methods of producing immunity artificially in domestic animals. A great many valuable observations and experiments have also been made in France by Nocard, Vallée, Carré, and others, as well as in Italy, Holland, and elsewhere. The result of all this work has been that a platform of sure knowledge has been reached, but it cannot be denied that much information is still needed to complete the knowledge of the natural history of the disease, the nature of the virus, and still more to enable proper methods of repulse and attack in the face of epidemics to be devised.

Whilst briefly recapitulating the basal facts which have been ascertained it may be useful to indicate at the same time the chief gaps in present knowledge. The virus can be obtained free from recognisable bacteria or other microbes in a clear watery filtrate after passing it through a porcelain filter, and the original blister fluid may be so potent that when diluted 100,000 times one cubic centimetre is sufficient to infect a susceptible animal. The blood also is infective early in the disease. The virus as examined in the laboratory is rendered inert by a temperature of 60° C. (for five to ten minutes), but weak disinfectants—e.g., 1 per cent. carbolic—do not necessarily destroy it. Uncontaminated virus will keep and remain active in the ice-box for months. The disease can be communicated by scarification, subcutaneous or intravenous injection, or by feeding. Exposure to light or drying has usually rendered innocuous material which has been deliberately contaminated.

Against this positive knowledge must be set the extreme variability in activity of the virus, the tendency for it to die out during experimental passage and, on the other hand, the high degree of infectivity of the spontaneous disease and the readiness with which inanimate objects and contaminated ground appear to be implicated in the natural transmission of the disease. There are no accepted experimental data showing how long and under what conditions straw, litter and fodder, or byres and stalls can retain infection.

No microscopically recognisable organism has at present any plausible claim to acceptance as the cause.

Infectivity of Cases of Disease.—Susceptibility of Different Animals.

As regards the infectivity of living animals suffering from "foot-and-mouth" it is known that, as a rule, the disease can be easily transmitted by wiping the mouth or lips of a susceptible animal with material from a case of disease. It has also been shown by Loeffler that an animal is occasionally capable of passing on the disease to its neighbours in a cowshed after apparent recovery for as long as seven months from the onset of illness. It is believed that the virus may be imprisoned in the horn of the hoof and subsequently be set free in an active condition four months after the attack by the wearing away of the hoof. On the other hand, Vallée has shown reason to think that the period of infectivity during the acute stage is rather brief, but that it begins during the incubation period.

Concerning the susceptibility and liability to carry infection of man and animals in the farmyard, other than cattle, sheep, and pigs, very little has been definitely settled, though Hecker claimed that nearly all such animals, including cats, dogs, rabbits, and owls, could be infected and the disease transmitted from them to ungulates. Loeffler, without recording many experiments, admitted the possibility of all animals and birds, especially starlings, carrying the infection passively, but he failed to infect rodents and birds, &c.

Immunity.

A great deal has been learnt about the production of active and passive immunity. Though protective serum from horses, oxen, or pigs can be obtained, it is either inapplicable for other reasons or too expensive for general use. Active immunisation by direct infection, "*aphtisation*," is uncertain in its results on account of the difficulty of regulating the severity of the attack or foretelling the duration of protection. Temporary passive immunisation by the injection of the serum of recovered animals may be of great use in the presence of an extending epidemic, especially in connexion with active immunity produced by inoculation immediately with virus from a previous case. The blood of animals taken during an attack has been advocated by French workers as a means of producing an immunising general illness of short duration without local lesions. The great bar to the utility of these various methods is the short duration of immunity even after an attack of disease, when a second attack may occur in so short a time as six months or even sooner. It has also been found by Vallée that one strain of the disease does not always protect against another strain of virus even for a few weeks. Prophylaxis, raising the natural immunity by inoculation of foreign protein, has been advocated as an expedient with a view to modifying the severity of an attack.

Animals Suitable for Laboratory Research.

Closely connected with the question of the susceptibility of rodents, &c., is the choice of animals for research. Loeffler and his colleagues gave no support to the view that rabbits and guinea-pigs could be used as laboratory animals, but in 1921 Waldmann and Pape found that guinea-pigs could be infected with considerable regularity if the inoculation were made on the hairless skin of the metatarsus and that by this means vesicles could be produced there and in the mouth. This discovery was confirmed by Hobmaier, Uhlenhuth, and others, and great hopes were raised that by the easier and cheaper methods of research thus opened up knowledge would be advanced more quickly. The new technique does not, however, appear to have given much advantage so far, though the virus can be kept active by passage through a series of guinea-pigs and remain still infective for large animals. The amount of virus obtainable in this way is not enough for the hyper-immunisation of large animals, and no definite attenuation has been associated with passage in these rodents at all comparable to that in the case of small-pox and vaccinia. Nevertheless, the fact that rodents are susceptible, despite previous failures to infect them, is an important piece of knowledge.

Work in Great Britain.

Turning to work which has been done in this country, the opportunities have been very limited. In the first place "foot-and-mouth" has been a rare disease here in comparison with the state of things prevailing on the continent of Europe, owing to the adoption of the policy of slaughter which has had considerable success, though less effective recently. The result of this draconic measure has been to make serious clinical observation in the field of the disease, its progress, infectivity, and means of spread very limited and experimental study impossible.

When in 1921 the Ministry of Agriculture decided to inaugurate research on foot-and-mouth disease, it was with the especial hope that it would be possible to cultivate the virus and work out a method of immunising animals prophylactically. It was considered necessary that the work should be done entirely on board ship and a disused mine-sweeper and a lighter for animals were fitted up for the purpose. It was not till after the research was over that the method of working with guinea-pigs was published, but in any case experiments with calves, sheep, or pigs were then, as now, an essential to the work. It was necessary not only to maintain a stock of virus, but to make experimental inoculations with very limited accommodation.

Experience soon showed that operations could proceed only very slowly and must be seriously limited in their scope and often brought to a standstill by want of demonstrably active virus. The laboratory was open for work for seven months, from the end of November, 1920, to July, 1921, but for most of that time an active virus was not available. It was found necessary about the latter date to close down the research as the result of the urgent demands for general economy in Government departments together with the impossibility of holding out the prospect of much gain to knowledge in the immediate future under the existing circumstances. This aspect of the venture has been explained by Prof. Robert Muir in a letter to the *Times* of Jan. 14th, who at the same time points out that future research is needed, but must be carried out on land, of course, with careful arrangements for isolation.

As a brief summary of the kind of research which is urgently needed the following lines of investigation may be suggested.

1. Further study of the purified as well as of the natural virus, especially with regard to its resistance to drying and daylight, and its culture.

2. Search for some reliable laboratory method of diagnosis, especially for the recognition of slight cases of disease, whether by inoculation of small animals or by some immunological test.

3. The investigation of the natural means of spread with regard to (*a*) the period of illness which animals are most infective and how long infectivity remains; (*b*) the persistence of the contagion on inanimate objects; (*c*) whether other animals than ungulates—e.g., rodents and birds—become infected naturally or act as passive porters of the virus, and in either case whether they are efficient as agents for the transmission of infection to farm stock.

The Practical Issue.

It is to be hoped that Great Britain will soon again be free from infection and then it will be seen whether the country, the Ministry, and the farmers will have the faith and courage to set up and maintain a proper experimental station on land in a place which can be sufficiently isolated. An easier, if less enterprising and more ignoble path would be to leave the investigation to our enthusiastic French, Dutch, and German fellow-sufferers.

There is a further consideration which should stimulate this country to take seriously the need for investigation of the whole subject here. The problem in this country is not quite the same as abroad. There, where the disease is always present with constantly recurring epidemics, the main flow of energy and hopeful enterprise has been towards devising schemes for prophylaxis by vaccination or serum, and for treatment and cure. But here the main problems are, have been, and will again be, prevention of invasion and avoidance of spread. For these objects an efficient vaccine or serum or both would be an invaluable addition to the armamentarium and might cut short an epidemic when it had started. There may, however, be other means to the desired end more suited to the protection of our insular position. To this end careful study should be devoted to all obscure points in the natural history of the disease, and an investigation into the question of the occurrence of the disease in every likely or possibly implicated animal should be thoroughly undertaken, in addition to inquiries into other possible means of transmission.

MEDICINE AND THE LAW.

A Coroner on Anæsthetics.

Dr. R. L. Guthrie, coroner for East London, recently held an inquest upon the body of a girl 3 years of age, who died while under an anæsthetic after undergoing an operation for ear trouble. The medical evidence was to the effect that death was due to the shock of the operation while under the anæsthetic, and the coroner recorded a verdict of death from misadventure, expressing himself as satisfied that the operation was urgent and properly performed and that the anæsthetic (ether) was properly administered. Nevertheless he is reported to have added observations to the effect that the number of deaths occurring under anæsthetics is "disquieting" or "alarming," and that it is unfortunate that "nothing seems to be gained or learned from them from a medical and surgical standpoint." He added that he believed that "in America the subject has been gone into more fully and that the medical and surgical societies are doing far more than we appear to be doing in this country in that matter." In consequence of the coroner's words the inquest was very widely reported in the lay press, and it is to be regretted that such observations should be made without careful consideration and the fullest possible information, particularly in connexion with a death where the coroner himself was unable to attach blame to anybody, and to which they were consequently irrelevant. In America and in this country the elimination of risks due to the use of anæsthetics is a subject of anxious care to anæsthetists and surgeons alike, and to suggest an invidious comparison between the two countries is unjust and misleading. Meanwhile the public should be reminded that thousands of operations take place daily from which the highest skill of surgeon and anæsthetist cannot exclude the possibility of a fatal ending, but that it is only the fatal endings that come under newspaper notice. They must judge whether such endings are frequent or not, when compared with the number of occasions when anæsthetics are administered. They must also remember that "death under an anæsthetic" is a somewhat loose term. A death after an operation may take place before the patient has recovered from the anæsthetic, and yet its administration may have contributed little or nothing at all to the fatality. A death due to an anæsthetic would be one which would have taken place if there had been no operation, or in which death was definitely traceable in some substantial degree to its administration. Even then it might be a case of taking a known risk as the only possible means of saving a patient's life.

Cancer of the Scrotum in a Mule-spinner: a Test Case.

At the Stalybridge County Court, before Judge H. W. Bairstow, K.C., on Jan. 11th, an application was made under the Workmen's Diseases Act, 1906, which was in the nature of a test case, on behalf of an operative spinner—Harry Whiteley—against the owners of the mill in which the operative worked. The Operative Spinners' Association took up the case, and Mr. E. Wingate-Saul, K.C., appeared for the applicant. The point at issue is whether epithelioma of the scrotum, to which it appears mule-spinners have been particularly liable, is one contracted in the course of their employment, and for which they should be compensated. Mr. Wingate-Saul submitted that the disease which the applicant had contracted was epithelioma of the scrotum, and was caused by mineral oil in the course of his employment. The records of the Manchester Royal Infirmary showed that during the 20 years 1902–22 there were 141 patients treated for this disease, and 69, or nearly 50 per cent., of these cases occurred in mule-spinners; further, that in almost every case the spinners were affected on the left side of the scrotum. In order to find out why this was so, and why mule-spinners were so prone to this disease, medical men visited various cotton mills to study the conditions under which the men worked, and to see the mule-spinners at work. They found that on the machines which the men operated there was a carriage which moved backwards and forwards about three feet above the floor, and this had to be followed by the operators. In front of the carriage was a steel bar, which the medical men noticed was always splashed with the mineral oil used for lubrication of the spindles. Threads which were constantly breaking had to be pieced up by the operator, and as they did this the left side of the body constantly came into contact with the steel bar covered with oil. The temperature of the room in which the men worked was high, and the men wore no clothing beyond a pair of trousers and a shirt. Mr. Wingate-Saul submitted that it was the irritation set up by the mineral oil, combined with that caused by the constant friction against the metal bar, that was responsible for the disease. The disease usually manifested itself by the presence of a small wart which was frequently malignant from the beginning, and the only successful cure was an operation performed in good time. The applicant in the present case discovered about two years ago that he had a small scrotal growth, which gradually increased in size, and for which on August 4th last he underwent an operation. The only question before the court was that of liability. A sample of the oil used on the machine would be shown to be such a mineral oil as was described in the schedule of the Workmen's Compensation Act. Mr. Eastham, K.C., who appeared for the mill-owners, called for the production of the medical certificate upon which the application for arbitration had been based. According to the particulars the certificate was dated March 4th, 1923, and referred to the disease from which the applicant suffered as "epitheliomatous ulceration." The only certificate which Mr. Wingate-Saul could produce was one dated July 18th, which referred to the disease as "epithelioma of the scrotum." Application was made for leave to amend the particulars by an alteration of the date and name of the disease in accordance with the July certificate. It was submitted by Mr. Eastham that the judge had no jurisdiction, on the ground that the action would be based on a certificate which had no existence when the proceedings were started, and also that the right to appeal to the medical referee on the question of the validity of the certificate would be prejudiced. The judge expressed his regret that a case of serious importance to all engaged in the cotton industry should be held up on what he suggested were purely technical grounds. After a long legal argument the case was adjourned sine die in order to give Mr. Eastham an opportunity for appealing to the medical referee over the new certificate. As Mr. Eastham formally objected to the judge's ruling on the question of jurisdiction, it is possible that the case will next be raised in the Court of Appeal.

Illegal "Procuring of Drugs."

Yasukichi Miyágawa, a Japanese merchant, was convicted recently at the Central Criminal Court of "procuring" and doing an act preparatory to procuring 500 lb. of morphine hydrochloride for Miyágawa and Co., a firm at Kobe, Japan, and was sentenced under the Dangerous Drugs Acts of 1920 and 1923 to penal servitude for three years, to pay the costs of the prosecution, and to be eventually expelled from this country. His appeal against this sentence has now been dismissed by the Court of Criminal Appeal. The principal point raised was of some importance; being, briefly, that as the transaction, the subject of the prosecution, consisted in the purchase of the drug in Switzerland for shipment to Japan without any bringing of it to this country, it was not a case of procuring within the Statutes referred to and the regulations made thereunder. In the course of the argument for the appellant the Lord Chief Justice pointed out that the shipping documents for the carriage of the drugs from Marseilles to Japan were sent to England, and that shipping documents had been described as "the key of the warehouse." In

delivering the judgment of the court, Lord Hewart said that the Acts and the regulation chiefly in question (Regulation 3 made May 20th, 1921, under the Act of 1920), if compared, did not support the appellant's contention that the physical bringing of the goods to this country, or the intention to bring them, must be proved before a charge of procuring or attempting to procure could be sustained. The sentence was no doubt severe, but it was impossible to believe that the accused acted innocently.

The Case of Ball v. Howard.

An action against a medical man was heard before Mr. Justice Bailhache in the King's Bench Division of the High Court on Jan. 23rd and 24th, damages being claimed on the ground of negligence in the performance of an operation for appendicitis. It was stated that the plaintiff patient requested that a specialist should be called in, but the defendant said that this was not necessary. The plaintiff went on well at first, but complications arose, for which a consulting surgeon, who was called in, performed a second operation, followed by a good recovery. Mr. Bailhache, in giving judgment, found the practitioner's conduct in general to be worthy of the profession of which he was an honourable member, but that contrary to his usual practice and habit, he had committed two serious errors of judgment: (1) In not attending at once to the patient's call; and (2) by going away without leaving proper instructions what to do. The plaintiff having suffered no permanent harm, Mr. Bailhache gave judgment for him with £70 damages and the costs of the action, and judgment for the defendant on his counter-claim of 30 guineas fee with costs of the counter-claim.

The Kind of Person that Kills.

It is regrettable that the matter of legal responsibility enters so largely into the investigation of such terrible acts as the recent murder of two children by their nurse, to the exclusion of the scientific study of the kind of person that kills. Jealousy and anger are common human failings; murder is rare, but we are without detailed life-histories that might give us an understanding of the dispositions which underlie crimes of this nature, though even such histories would constitute only the approach to a subject which involves the fullest investigation of the mind of the criminal. The horror aroused by this deed should not shut out consideration of the mental stress and conflict that led to it, for the murderer's previous behaviour and undoubted love for her victims suggest an exaggeration and distortion of the noblest of instincts. The weapons of modern psychology have enabled us to understand something of the unconscious urgings of the minor delinquent; their application to such cases as this might add to knowledge whilst leaving to society the right to decide whether or how that knowledge should be applied.

TUBERCULOSIS.

Coördination of the Work of Tuberculosis Officers and Insurance Practitioners.

THE Ministry of Health has issued a Memorandum, dated December, 1923, on this subject (Memo. 286). It is a timely exhortation to coöperation, and it gives notice of certain alterations in the terms of service of insurance practitioners who, in the future, must send their initial and periodical reports on cases of tuberculosis direct to the tuberculosis officers instead of, as formerly, to the regional medical officer of the Ministry of Health. The Memorandum pays special attention to the cases in which tuberculosis is suspected but cannot be definitely diagnosed. These cases are almost incredibly numerous and, from the administrative point of view, are very difficult to deal with. Yet their successful handling would probably do more to stamp out tuberculosis than any other single measure. The Memorandum suggests that "it will usually be to the interest of the patient that the case should be referred to the tuberculosis officer, both in order that a second opinion may be obtained on the diagnosis, and in order that there may be no avoidable delay in giving the patient the benefit of any facilities available under the scheme of the local authority for diagnosis, treatment, or general care and supervision." This advice is, on the whole, sound, and it will be still more helpful when the tuberculosis service is staffed only by specialists in tuberculosis and not by medical officers of health who act as part-time tuberculosis officers and who have little or no special knowledge of tuberculosis. The Memorandum also lays down certain rules in order that there may be no doubt as to who is responsible for the treatment of a patient at any particular time. In the past the patient has been apt to fall between two stools, represented by the tuberculosis officer and the insurance practitioner respectively.

The Costs of Residential Tuberculosis Institutions.

A document, which promises to become an annual institution, has been published by the Ministry of Health under date December, 1923. It shows in tabulated form the cost of running the various public institutions for tuberculosis in this country. These tables are guaranteed to provide much disciplinary heart-burning and heart-searching, and they show at a glance that the administration of certain institutions is conducted on much more economical lines than that of others. Indeed, in some cases economy would seem to have been raised to such a high, or reduced to such a low, level (it all depends on the point of view) that it is natural to ask whether efficiency has gone hand in hand with economy. In one column the average number of the staff to each 10 beds is published, and it is noteworthy that at one institution this number is as high as 6·5, whereas in another institution it is as low as 2·3. As for the cost of living, the fluctuations are also great; at one institution the average cost per head for provisions is over 28*s.* per week, whereas at another institution this average is under 10*s.* It is pointed out that the information in these tables may be of substantial assistance in enabling the authorities concerned "to decide whether in a given case the various items of expenditure are on the lowest possible level compatible with efficiency." The publication of these tables should have a salutary effect not only on those institutions where expenditure is excessive, but also on those, if such there be, where expenditure has been reduced to a level incompatible with efficiency.

GYNÆCOLOGY AND OBSTETRICS IN SCANDINAVIA.

THE twenty-fifth anniversary of the Gynæcological and Obstetrical Society of Copenhagen has recently been celebrated by a special number of *Acta Gynæcologica Scandinavica*,[1] to which Danish and Swedish specialists in gynæcology and obstetrics have contributed 17 original articles. Some are of strictly limited interest; a paper on the occurrence of eosinophil cells in the appendix of the fœtus and new-born infant is not calculated to be of interest to many. But several of the papers are of both general and scientific interest, and they show, among other things, how closely Scandinavian gynæcologists are in touch with the outer world.

The Place of Cæsarean Section in Obstetrics.

There are two papers with this heading, and the authors represent opposite schools of thought. Prof. Elis Essen-Möller, of Lund, Sweden, discusses the risks of rupture of the scar of the classic Cæsarean section when the patient is again confined, and he holds that the importance of this risk has been exaggerated. If asepsis is maintained, and linen or silk sutures are used instead of catgut, there should be little chance of a weak scar being left. As for the choice between the classic and cervical sections, he finds that in

[1] Vol. ii., fasc. 3, 1923.

aseptic cases the two operations are about equally safe for the mother and infant; it is not yet possible to decide whether the scar in the uterus is more firm after one operation than the other. In defence of the classic operation he stresses its special advantages in cases of placenta prævia, in certain other emergencies rendering it absolutely necessary to remove the fœtus at once, and in the case of elderly primiparæ. But in cases suspected of sepsis he is not in favour of the classic operation, and of the two alternatives—the transperitoneal and the extraperitoneal cervical sections—he much prefers the former. Even when a case has been definitely septic, he notes that, according to the literature, better results, as far as the mothers were concerned, have been obtained with the transperitoneal than with the extraperitoneal operation. This has surprised him, for he had expected that germs would be more dangerous in the peritoneum than in the connective tissue, and that a phlegmon must be less serious than a peritonitis. At his hospital Cæsarean section has been performed in 132 cases since 1900, the chief indication being disproportion between head and pelvis (95 cases). Of the nine fœtal deaths, seven had occurred before the operation. Another fœtal death was due to congenital malformation of the fœtus, and the remaining fœtal death was due to defective ligature of the umbilical cord, the infant bleeding to death. Thus none of the fœtal deaths could be laid at the door of the operation itself. Among the maternal deaths there was one from peritonitis, one from intestinal obstruction caused by strangulation of a loop of the intestine between a myoma of the uterus and the pelvis, three were due to eclampsia, and one was probably due to air embolism.

The other paper on this subject is by Dr. Viggo Esmann, who seems to find certain objections to the growing popularity of Cæsarean section. In cases of habitual death of the fœtus a few weeks before term, he is in favour rather of inducing premature labour than of performing Cæsarean section. He takes the same line when difficult labour at term is anticipated on account of slight disproportion between the head and the pelvis. In 1916 he gave an account of 23 cases in which premature labour had been induced, and among these cases there were only four fœtal deaths, to two of which prolapse of the cord contributed. Since 1916 he has induced premature labour in 24 cases because he anticipated mechanical difficulties, and of the two infants who died, one was malformed and not viable. All the mothers left hospital in good health. Hence his conclusion that this procedure was more successful as well as more natural than the more radical undertaking of a Cæsarean section would have been.

Treatment of Dystocia Due to Bandl's Ring.

Dystocia due to Bandl's ring has recently been characterised as a figment of the imagination, but Prof. E. Hauch refuses to subscribe to this agnostic teaching and states that since the obstetrical service B of the Rigshospital in Copenhagen was started some dozen years ago, 25 cases of dystocia from this cause have been observed among about 20,000 confinements. In 12 of these cases the diagnosis of Bandl's ring was confirmed by abdominal palpation. This revealed a distinct furrow in the uterus which, in one case, was so marked as to give the uterus an hour-glass shape. In the rare cases in which this condition is diagnosed early, he is in favour of giving morphine and waiting for at least an hour in the hope that the contraction may pass off. He adds the warning that the morphine may render the infant oligopnœic at birth, artificial respiration being necessary for some time. In most cases, however, matters have proceeded so far that it is necessary to terminate labour as soon as possible, and the course to be followed must depend on whether the infant is already dead or not. In the former case, forceps may be applied or perforation and basiotripsy performed. Another procedure is decapitation with version and extraction. If, however, the infant is still alive, and the case is not already septic, the best procedure is transperitoneal cervical Cæsarean section. If this operation is contra-indicated, an attempt should be made to bring down an arm and apply forceps.

Kielland's Forceps.

The arguments for and against the use of Kielland's forceps are discussed by Dr. Oscar Horn, who has used them in 70 cases. He also summarises the bulky literature on the subject. He naturally finds that the authorities who have used these forceps extensively are greatly impressed by their superiority over other forceps, whereas the opponents of the Kielland forceps have either not used them at all or only seldom. Dr. Horn concludes that Kielland's forceps undoubtedly require a more accurate topographical diagnosis as well as more practice than the older and simpler forceps, but when these two conditions are fulfilled, Kielland's forceps may be most helpful in cases of difficult labour. He had only one maternal death (pulmonary embolism on the fourteenth day) among his 70 cases, and only six fœtal deaths. When he first began to use these forceps, he fairly often found a clear-cut mark close to the external canthus of one eye, but during the last few years he has not seen this mark. In three or four cases there was slight transitory facial paresis, but only in one case did it last as long as eight days.

Diagnosis of Pregnancy by the Induction of Glycosuria.

Dr. F. Jensen traces the development of these tests for pregnancy since 1920, when Frank pointed out that the administration of 100 g. of grape sugar by the mouth on an empty stomach provokes glycosuria in pregnant women but not in others. Subsequently two other tests have been devised, both of which also depend on the fact that the capacity for assimilating carbohydrates is reduced in pregnancy. One of these tests, associated with the names of Joseph and Kamnitzer, consists of injecting 2 mg. of phloridzin, which provokes glycosuria in the pregnant but not in others. The other test, that of Brinitzer and Roubitschek, consists of inducing glycosuria by an injection of adrenalin after 10 g. of grape sugar have been given by the mouth. Dr. Jensen has worked with Frank's test, which he has modified, and instead of giving 100 g. of grape sugar in every case, he gives 1 g. for every kilo of body-weight. He comes to the conclusion that though the blood-sugar examinations render this test tedious, and at present suitable only for hospital practice, it is remarkably trustworthy, giving useful information in cases of threatened abortion as to whether the fœtus is dead or alive. The phloridzin test may be easier, as it is not necessary to carry out blood-sugar examinations, but only when it is negative is its evidence of value.

The Ultimate Results of Menge's Hysterorrhaphia.

Dr. W. Ottesen, of the Diakonissestiftelsens Hospital in Copenhagen, has investigated the subsequent fate of the patients on whom Menge's hysterorrhaphia was performed in the period 1909–20. He succeeded in tracing 55, 40 of whom were re-examined in his own hospital, 10 were re-examined elsewhere, and 5 sent a written report of their health after the operation. Among the 50 who were medically re-examined, there were only two showing a definite relapse, and in neither of these cases was the uterus so much retroflexed that its fundus lay at the bottom of the pouch of Douglas. It was also found that subsequent pregnancies and labours had not been disturbed by this operation, the technique of which was described in 1904.[2]

Spurious Perforation of the Uterus.

Dr. H. Wulff records a remarkable case which may bring some consolatory reflections to obstetricians who have pleaded guilty to perforating the uterus while curetting it for an abortion. Dr. Wulff's patient was a married II-para, aged 39, who suffered from incomplete abortion in the eighth to the tenth week of pregnancy. Examination under ether anæsthesia showed the

[2] Centralblatt f. Gynäkologie, No. 21, 1904.

cervix to be soft, the external os admitting the tip of one finger. The body of the uterus was anteflexed, anteverted, freely movable, and very soft. Dilatation was started with Hegar's No. 12. Some difficulty was experienced with Nos. 16, 17, and 18. Dilatation proceeded somewhat more easily with the larger numbers, and was continued up to No. 26. A curette was now introduced to a distance of 14 or 15 cm., and some placental tissue was removed. It was suddenly found that the curette could pass a distance of 23 cm. without encountering the slightest resistance in various directions. On bimanual examination the uterus was so soft as to be hardly palpable. Perforation of the posterior wall of the uterus was diagnosed, and hysterotomia anterior vaginalis was undertaken. It was found that the cervix had not been injured, and when a finger was introduced into the uterus, its relaxed walls could be felt definitely contracting. The fœtus and some placental tissue were removed, and the interior of the uterus was carefully explored by palpation. At no point could any perforation be found. Though the patient's recovery was delayed by protracted fever, a malodorous vaginal discharge, and pneumonia, there were no signs of peritonitis, and she was ultimately discharged as cured, with satisfactory involution of the uterus and mobility of its appendages. Dr. Wulff assumes that this was a case of relaxation of the uterus and not of perforation, but he admits that, not having removed the uterus for examination, he cannot swear to its freedom from a perforation.

This special number of *Acta Gynæcologica Scandinavica* also contains an account, by Dr. J. Fog, of a case of considerable medico-legal interest. It was that of a female infant, found alive on a railway line, 10 minutes after an express train had passed. Though both parietal bones were fractured, death did not occur till six hours after the infant was found. The mother had evidently been overtaken by precipitate labour while in the lavatory of the train. This and many other papers make the anniversary number of this journal interesting reading.

SWITZERLAND AND THE OPIUM CONVENTION.

(FROM OUR OWN CORRESPONDENT.)

AT the last assembly of the League of Nations Switzerland was severely criticised by Dame Edith Littelton, the British delegate, for not having yet joined the Opium Convention. As a matter of fact, the Convention was signed in 1913 by the Swiss Minister at The Hague, but it was never ratified by the Federal Parliament. The reasons for this failure are several. One is constitutional. Legislation on general hygienic matters belongs to the cantons. The Federal Government cannot on its own power regulate the production and traffic of certain drugs. This belongs to the sphere of the different cantons. This constitutional difficulty was the cause that the question was allowed to sleep. As the drug-habit is practically unknown in Switzerland public opinion did not take much interest in the Opium Convention. On the other side there was the opposition of certain chemical industries which feared a considerable damage through the regulations of the Convention. Naturally in a small country like Switzerland the control would be much more effective than in a country with vast colonial possessions. It was feared that while inflicting an enormous damage on one of our flourishing industries the ultimate scope of the Convention would be frustrated by the Great Powers tolerating drug-production on a large scale in their colonies. This lack of confidence found recent expression by Dr. A. Jaquet, professor of pharmacology at the University of Basle. Prof. Jaquet writes:—

"Whoever studies the question since the opium wars cannot deny that this is a great enterprise of international hypocrisy; the States interested in opium production and opium traffic are hiding their fiscal interests under a humanitarian cover. The Opium Conference of Shanghai and the Conference at The Hague of 1911 were summoned with the definite object to suppress with all means the production of and traffic with opium. With time this object vanished in the background as the States interested in the opium commerce formulated so many conditions for their coöperation that the war against the opium pest become more or less illusory. Instead, the Conference concentrated its efforts more and more on the regulation of production and traffic of the alkaloids of opium and of cocaine with the object of curtailing both. . . . I am of opinion that it would be best if each country would deal separately in combating the misuse of morphia and cocaine without taking refuge in an International Convention of which the great would take but small notice and which would crush the small."

I have quoted these words of an impartial observer. His views are shared by many Swiss not in the least interested in the chemical trade. In the last years, however, opinion is coming round in favour of a speedy ratification of the Convention. This change is probably due to the influence of the League of Nations on the Opium Commission. The Federal Council has lately been strongly attacked both in the press and in Parliament for moving so slowly in this matter. Under this pressure the Federal Council has prepared a Bill on narcotic drugs which will shortly be submitted to Parliament. When this Bill has become law the Convention can be signed. Waiving some constitutional scruples the Government bases the Bill on a paragraph in the constitution empowering the Federal Council to take legislative action for combating epidemic diseases. The Bill, which is dated Dec. 12th, 1923, provides for the supervision of import, export, production, manufacture, storage, purchase, sale, and distribution of the following drugs: opium in all its forms, morphia and its salts and all preparations containing more than 0·2 per cent. of morphia; heroin, its salts and preparations containing more than 0·1 per cent. of heroin; coca-leaves; cocaine, its salts and preparations containing more than 0·1 per cent. of cocaine. Production of and trade in these drugs are only allowed with a Government licence. Export to other countries which have signed the Convention is only granted if the addressee has a licence for his respective country. This Bill may be taken as a clear indication that the Swiss Government intends to carry out loyally and scrupulously the provisions of the Opium Convention.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Delhi: National Baby Week.

IMMENSE activity is being shown throughout India in connexion with a National Baby Week which is being held in all parts of the country during the third week in January. The "Week" is celebrated at Delhi so as to coincide with the meeting of the Legislative Assembly, and an effort is being made to direct the attention of India's new legislators to the appalling loss of human life which is going on throughout the Peninsula. As is well known, on an average 400 babies out of every 1000 born alive die before they complete their first year in the great Indian cities, and the rate is often much higher.

With a view to preventing the outbreak of plague in Delhi, the Public Health Commissioner with the Government of India has worked out a scheme for intensive rat destruction and the closing down of existing grain stores and their replacement by rat-proof buildings, but although the municipality is willing to provide half the cost of the proposed measures their execution is held up for want of help from the Government.

The recently founded University of Delhi, at which the Inchcape axe is levelled, issued its first report at Christmas. The report forms an excellent apologia for the University's existence, but there is already a flourishing university at Lahore, less than 300 miles away.

Lahore: A Professional Tax on Doctors.

The Lahore Municipal Committee recently proposed the imposition of a professional tax on medical men. As a protest against this measure a largely attended meeting of medical men was held in the city on Dec. 23rd, out of which a committee was appointed to initiate propaganda against the tax and to secure its withdrawal by the Lahore Municipality. It was pointed out that the only two callings which are affected by the proposed tax are the legal and the medical professions, and that if the scheme is carried out medical fees will have to be raised and the public may resort to the large number of quacks practising in the city whom the tax will not affect.

Calcutta: The Exhibition.

At the Calcutta Exhibition, open until the end of January, an exhibit of great interest is a chart by Dr. C. A. Bentley among the official exhibits of the Bengal Public Health Department. "The graph of prices and mortality of each district," he writes, "shows that the seasonal course of prices (of rice) is in all probability the main factor determining the peculiar seasonal mortality curve observable in Bengal, which differs markedly from that of the other provinces." It is clear that in Bengal measures aimed at restricting the prices of agricultural production may be fraught with the very gravest consequences to the health and welfare of the population whose prosperity is almost wholly dependent upon two factors—the general character of the harvest and the monetary return obtained from the sale of crops. If rice fetches a good price the mortality is low and vice versa.

For the establishment of a Pasteur Institute in Calcutta representations are being made to the Governor of India by the Bengal Chamber of Commerce. The nearest anti-rabic institute to the second city of the Empire is at Shillong, and as over a thousand patients were sent there from Bengal last year, it is difficult to resist the claims of the premier Presidency to an institute of its own.

Delhi, Jan. 11th.

SECRET REMEDIES:

FORMULAS DISCLOSED BY THE MAKERS.

PATENT medicines sold in Italy must have their composition stated on the label, and although the formula given may not be always the right one, it is of interest to learn the composition of some well-advertised British and American specialties as "disclosed" by the makers themselves. Of 62 such formulas, 10 were found to be practically identical with those given in "Secret Remedies."[1] 14 others differed materially from the B.M.A. analyses. The remaining 37 patent medicines were not mentioned in these publications. Quantities are given in grammes or cubic centimetres unless otherwise stated.

Formulas not Found in "Secret Remedies."

Albert's Grasshopper Pills.—Aloë barb., 0·12; Colocynth., 0·04; Jalap res., 0·02; Pulv. zingiber, 0·006; Sapo dur., 0·03.

Albert's Grasshopper Ointment.—Ol. oliv., 30; Ol. palm., 180; Res. coloph., 270; Cera flav., 60.

Allen's Foot-Ease.—Acid. salicyl., 5; Acid. boric, 45; Magn. silic., 50.

Angier's Throat Tablets.—Pulv. cort. ulm. fulv., 1·0; Extr. glycyrrh., 0·02; Extr. tussilago farf., 0·03; Paraff. liq., 0·15.

Antexema Granules.—Calc. sulphid., 0·06.

Battle's Bromidia.—Chloral hydrate, 15 per cent.; Pot. brom., 15 per cent.; Extr. hyoscyam., 0·12 per cent.; Sacchar, 15 per cent.; Syr. aurant., 15 per cent.; Extr. glycyrrh., 5 per cent.; Aq. aurant. cort. ad 100 per cent.

Battle's Iodia.—Extr. liq. Stillingio sylvat., Helonia lut., Pimpinella saxifraga., Menispermium offic., part. equal. ad 125·0; Pot. iod., 7·5; Ferr. pyrophosph., 5·0.

Bell's Pa-pay-ans.—Papain, 0·06; Carb. veget., 0·06; Sod. bicarb., 0·06; Ol. menth. pip., 0·002; Ol. gaulther., 0·002.

Bristol's Pills.—Aloë soc., 0·06; Pulv. rhei., 0·05; Pulv scamm., 0·03; Sapo dur., 0·02; Syr. simpl., q.s.

Cascarets.—Extr. casc. sagr. ("rendered non-bitter") 0·12; Extr. glycyrrh., 0·25; Ol. anis., Ol. menth. pip., Pulv. acac., Sacch. alb., q.s.

Collis Browne's Chlorodyne.—Chloroform, 6·0; Molasses 25·0; Extr. glycyrrh., 12·0; Morph. hydrochlor., 0·50; Ol. menth. pip., 0·10; Tinct. cannab. ind., 3·0; Tinct. capsic., 1·50; Syr. simpl., 35·0; Alcohol, q.s. ad 100·0.

Cuticura Pills.—Aloin, 0·02; Jalapin, 0·02; Podophyllin 0·008; Capsicin, 0·001.

Darley's Toothache Plasters (Johnson and Johnson).—Pimento, Piper nigr., Caryophyll., 10 per cent. of each; Rubber solution, q.s.

Elliman's Embrocation.—Acid. acetic (30 per cent.), 180; Ol. terebinth., 300; Camphor., 20; Ovi vitell., 100; Aq. dest., 400.

Evans's Pastilles ("Special formula for Italy").—Ol. pini essent., 0·01; Menthol, 0·002; Pot. chlorat., 0·003; Sod. biborat., 0·03; Extr. glycyrrh., 0·17; Pulv. acac., Sacch. q.s.

Fellows's Syrup of Hypophosphites.—Mang. hypophosph., Pot. hypophosph., Sod. hypophosph., Ferr. hypophosph., of each 0·009; Calc. hypophosph., 0·0005; Quinine, 0·003; Strychnine, 0·0011.

Foster's Backache and Kidney Pills.—Pot. nitr., 0·024; Ginep (? juniper), 0·005; Uva ursi, 0·008; Tereb. venet., 0·024; Excip., q.s.

Foster's Digestive Pills.—Podophyllin, 0·011; Leptandrin, Extr. hyoscyam., Aloin, of each, 0·008; Rad. (?) jalap, 0·004. "With tonics and laxatives."

International Chemical Co.'s Bisuroids.—Each tablet contains phenolphthalein, 0·135.

Ecorces d'arémone.—Sapo moll., 75; Glycerin, 25; Pot. iod., 15; Sod. biborat., 1; Citral., 2; Aq. dest., 88.

Fosfiron.—Ferr. nucleophosph., 0·06; Calc. glycerophosph., 0·3; Cinchona alkaloids, 0·05; Caffein, 0·03.

Kassium Extract.—Extr. "cassium lign.," 0·02; Rad. gossyp. barb., 0·04; Calc. glycerophosph., 0·15; Ferr. glycerophosph., 0·03; Ol. anisi, 0·0006; Excip., q.s.

Lactopeptine Powder.—Lactose, 40 oz.; Pepsin, 8 oz.; Pancreatin, 6 oz.; Diatase, 4 dm.; Acid. lactic., Acid. hydrochlor., of each, 5 fl. oz.

Langdale's Cinnamon Tablets.—Ol. cinnamom., 0·25; Pulv. acac., Sacch. alb., q.s. Coloured with carmine.

Langdale's Essence of Cinnamom.—Ol. cinnamom., 30; Tinct. cinnamom., 30; Alcohol (90°), 54.

Marshall's Cigarettes.—Lobel. inflat., 20; Datur. stramon 55; Piper cubeb, 20; Pot. nitr., 5.

Naldire's Worm Powders.—Nuc. arec. pulv., 4·0; Jala pulv., 0·5; Rosmarin pulv., 0.5.

New Skin.—Pyroxylin, 5; Acetone, 50; Benzole, 20; Amyl acetate, 25.

Norton's Pills.—Aloë cap., 0·03; Extr. gentian, 0·12; Ol. camom., 0·02; Pulv. gentian., q.s.

Pazo Ointment.—Zinc oxide, 10; Camphor, 5; Carbolic acid, 1; Balsam of Peru, 4; Extr. hamamel., 6; Cera flav., 4; Adeps benz., 70.

Reudel's Bath Saltrates.—Magn. carb., 0·005; Calc. carb. 0·005; Pot. carb., 0·00125; Calc. sulphat., 0·0025; Sod. chlor., 0·0012; Lith. carb., 0·00005; Sod., biborat., 0·10; Sod. bicarb., 0·305; Sod. carb., 0·50; Hydrogen sulphid 0·025; "Baregine," 0·025; "Oxygenated Salts," 0·03; Radio-active substances, traces; essent. aromat., q.s.

Roche's Embrocation.—Ol. caryophyll., Ol. succini., Ol. limon. of each, 15; Ol. olivæ, 55.

St. Jacob's Oil.—Ol. terebinth., 60; Ether sulph., 25; Camphor, 10; Rad. anchus, 0·25.

Salrads. Concentrated (*Tokalon*).—"The active constituents of rhamnus purshianus, ginger and gentian," with Caffeine, 0·30; Lithia, 0·5; and Alcohol, 2·5 per cent.

Scott's Emulsion.—Ol. morrh., 44; Glycerin, 16; Sodii calcii hypophosph. (1·25 per cent.), 20; Sol. sod. hypophosp. (0·625 per cent.), 20; Alcohol, tragacanth, Ess. oils, q.s.

Smedley's Paste.—Pulv. capsic., 4; Adeps pur., 60; Rad. anchus., 1.

Winter's Nature and Health Restorer.—Pulv. rhei, 0·06; Podophyllin, 0·001; Aloë, 0·06; Capsicum., 0·0005; Ment. puleg., 0·02; Extr. senn., 0·06; Menth. sativ., 0·02; Pulv. glycyrrh., 0·005.

Formulas Differing from "Secret Remedies."

In the following list the ingredients are given, first as stated on the Italian label, secondly (in parentheses) as stated in "Secret Remedies." Present but quantity not determined is denoted by n.d. A dash implies that the ingredient is not mentioned in one case or the other. As before, quantities are given in grammes or cubic centimetres unless otherwise stated.

Antipon.—Alcohol, — (0·4 per cent.); Acid citr., — (grs. 39·3); Syr. simpl., 10 (—); Coccus cact., 1 (n.d.); Aq. dest., 100 (ad 1 oz.).

[1] British Medical Association, 1909 and 1912.

Bishop's Varalettes.—Lith. citr., 0·12 (n.d.); Piperazin. 0·01 (n.d.); Sod. bicarb., 0·20 (n.d.); Acid. tart., 0·15 (n.d.). *Carter's Little Liver Pills.* Aloin, 0·020 (n.d.); Jalapin, 0·020 (—); Podophyllin, 0·008 (n.d.); Capsicin, 0·001 (—); Pulv. glycyrrh., — (n.d.).

Cadum.—Zinc. oxid., 20 (11·3); Sulph. (flowers), 5 (8·0); Methyl salicyl., 1 (—); Ol. cadini, 1 (7); Acid. boric, — (3·1); Acid. salicyl., — (0·8); Vaseline, 73 (60); Hard paraffin, — (10).

Doan's Backache and Kidney Pills. Pot. nitr., 0·024 (v); Ol. junip., 0·050 (m. 1); Extr. uvæ ursi, 0·050 (—); Pulv. fœnugreek,—(grs. 17); excipient, q.s. (grs. 6); f. pil. 1 (f. pil. xx).

Eade's Gout and Rheumatic Pills. Aloë barb., 0·03 (10 per cent.); Extr. colch., 0·016 (18 per cent.); Pulv. colch., 0·065 (35 per cent.); Excipient, q.s. (37 per cent.).

Guy's Tonic.—Acid. hydrochlor. dil., 0·60 (0·59); Acid. phosph. dil., 0·55 (0·52); Alcohol (95 per cent.), 2·50 (2.27); Inf. gent. co., 10 (40); Tinc. cocci, 0·25 (q.s.); Chloroform, 0·20 (—); Aq. chlorof., — (50); Aq. ad (100), 100.

Holloway's Pills.—Aloes, 0·03 (n.d.); Pulv. zingiber, 0·03 (n.d.); Sapo dur., 0·15 (n.d.); Excipient, q.s. (—).

Kay's Linseed Compound.—Morph. hydrochlor., 0·02 (0·021 per cent.); Chloroform, 1·08 (1·07 per cent.); Alcohol, 1·30 (1·3 per cent.); Extr. ipecac. liq., 0·70 (0·007 per cent. alkaloid); Syr. scillæ, 10·0 (n.d.); Extr. glycyrrh. liq., 10·0 (—); Malt, 20·0 (n.d.); Decoct. sem. lini., 20·0 (n.d.); Ol. anisi, — (n.d.); Syr. tolut., — (n.d.); Syr. simpl., ad 100 (n.d.).

Owbridge's Lung Tonic.—Syr. marubii, 25 (—); Sy. sem. lini. (?), 25 (—); Acet. ipecac., 7·50 (0·002 per cent. alkaloids); Malt, 25 (n.d.); Chloroform, 0·50 (0·3 per cent); Ol. anisi, 0·10 (n.d.); Ol. caryophyll., 0·10 (—); Ol. menth. pip., 0·10 (n.d.); Alcohol, — (2 per cent.); Capsicum, — (n.d.); Aq., ad 100 (—).

Peps.—Extr. glycyrrh., 25 (25); Sacch. alb., 70 (70); Ol. menth. pip., 0·50 (trace); Ol. anisi, 0·50 (trace); Ol. pini, 1·00 (—); Extr. capsic. liq., 0·20 (—); Acid. tart., 1·00 (—); Extr. tussilago liq., 1·80 (—); Resinous matter, — (0·7); Talc, — (4).

Whelpton's Vegetable (Purifying) Pills. (Whelpton's vegetable pills in Italy).—Aloë soc., 0·06 (n.d.); Pulv. rhei., 0·05 (—); Pulv. scammon., 0·03 (—); Sapo dur., 0·02 (—); Syr. simpl., q.s. (—); Colocynth, — (n.d.); Zingiber, — (n.d.); Gentian., — (n.d.).

Williams's Pink Pills.—Pot. carb., 0·07 (0·66); Ferr. sulph., 0·08 (0·75); Mang. oxid. pur., 0·02 (—); Sacch., 0·03 (0·2); Extr. gentian., 0·025 (—); Aloes, 0·009 (—); Magnesia, — (0·09); Pulv. glycyrrh., — (1·4).

Woodward's Gripe Water.—Sod. bicarb., 1·0 (1·08 per cent.); Sod. brom., 1·0 (—); Ol. anethi, 0·01 (—); Ol. carui, 0·02 (—); Sacch. alb., 20 (20·5 per cent.); Essent. oil, — (0·03 per cent.); Alcohol,—(3·8 per cent.); Aq., ad 100 (—).

The Services.

ROYAL ARMY MEDICAL CORPS.

Capt. M. St. C. Hamilton is placed on the half pay list on account of ill-health.

Lt. A. M. Simson to be Capt and to remain seed.

Temp. Capt. J. A. Marsden relinquishes his commn. and retains the rank of Capt.

RESERVE OF OFFICERS.

Lt.-Col. A. E. Master, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

MILITIA.

Capt. S. Miller to be Maj.

TERRITORIAL FORCE.

Maj. W. Macdonald resigns his commn. and is granted the rank of Lt.-Col.

J. D. M. Cardell to be Lt.

Maj. T. H. Oliver (late R.A.M.C.) to be Maj.

INDIAN MEDICAL SERVICE.

Maj. J. N. Whitamore has vacated the appointment of superintendent of Ambala District Jail. Capt. L. S. C. Roche, M.C., has been appointed Cantonment Magistrate, Amritsar.

DEATHS IN THE SERVICES.

Brig. Surg. Maj. William Creagh, third son of the late Lt. James Creagh, who died on Jan. 18th in his eighty-sixth year, qualified with the diploma of the Royal College of Surgeons in Ireland in 1857. He obtained the L.S.A. two years later, when he also received his first commission in the Army Medical Service. Later he became attached to the Royal Horse Artillery and saw service in the Afghan War of 1878–80, when he was mentioned in despatches and received the medal. He retired in 1882.

Correspondence.

"Audi alteram partem."

YEAST AND CONSTIPATION.

To the Editor of THE LANCET.

SIR,—In an annotation with this title in THE LANCET of Jan. 26th reference is made to the recent work of Dr. L. Gross and it is stated that he "failed to confirm" the mucosal atrophy of the intestine in vitamin A deficiency described by me. The statements made in your editorial columns are, as a rule, so reliable that I feel compelled to point out that Dr. Gross himself does not draw such a conclusion in his paper. Nor can such a conclusion be drawn from his observations. He worked with adult rats of about 200 g. weight and subjected them to a vitamin deficiency for an average of only six weeks. It is well known to everybody engaged in this kind of work that adult rats are much less susceptible to vitamin A deficiency, than young rats. Thus with our homogeneous stock a young rat of 50 g. weight will develop keratomalacia after seven to eight weeks of vitamin A deficiency, while older rats of the same stock weighing 160–180 g. will only develop keratomalacia after five to six months or more. The atrophic change in the intestinal mucosa which I have described occurs in young rats after seven to eight weeks of vitamin A deficiency when they also develop the eye infection which has recently been shown to be associated with a similar atrophic change in one of the paraocular glands. It is therefore not to be expected that the experimental conditions of Dr. Gross's experiment could have shown the atrophic changes which we have observed. Dr. Gross has realised this clearly, for referring to my observations he writes: "I can only assume that the discrepancy in our results is due either to the fact that the rats which he employed were young and growing whereas mine were adult, or to a difference in the length of time on the diet." If Dr. Gross's observations of the effects of a six weeks' deficiency in vitamin A on adult rats were to be taken as failure to confirm the occurrence of an atrophic change in the intestinal mucosa, they should also be taken as a failure to confirm the occurrence of keratomalacia, which is absurd.

I am, Sir, yours faithfully.

W. CRAMER.

Imperial Cancer Research Fund, 8–11, Queen-square, London, W.C., Jan. 26th, 1924.

COLD AND HÆMOPTYSIS IN PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—In sanatoria for patients suffering from pulmonary tuberculosis cases of hæmoptysis often occur without any predisposing cause. The most common predisposing causes of hæmoptysis are over-exertion, excitement, strain from carrying heavy weights or from excessive coughing, traumatism. These causes do not usually exist in sanatoria, but still hæmoptysis occurs frequently enough to demand some investigation. In a series of 100 cases of pulmonary tuberculosis who have had hæmoptysis during their stay in sanatoria, I have tabulated the times of onset of the hæmorrhage as follows:—

Number of cases which have had hæmoptysis commencing between the hours of 9 P.M. and 7 A.M. ..	57
Number of cases which have had hæmoptysis commencing between the hours of 9 P.M. and 7 A.M., and in which on investigation the hæmoptysis could be put down to some predisposing cause	4
Number of cases which have had hæmoptysis commencing between the hours of 7 A.M. and 9 P.M. ..	39

Patients were all in bed between the hours 9 P.M. and 7 A.M.

It will be noticed from these figures that 57 per cent. of these cases of hæmoptysis occurred without any apparent predisposing cause. These 100 cases

(68 male adults and 32 female adults) were all moderately early cases of pulmonary tuberculosis, the temperature of their sleeping quarters being for all practical purposes that of the open air, but there appears to be no satisfactory explanation why hæmoptysis seems more likely to happen during the period patients are in bed, a point on which Fishberg [1] comments.

I think that sufficient attention has not been drawn to the temperature of the air. Barcroft and Marshall [2] have found that as a result of exposure to cold the volume of blood passed per minute by the heart into the circulation is increased. The amount of this increase varies from person to person. I would suggest that, as a result of the increased volume of blood passing through the lungs, hæmoptysis is more likely to occur during the time of the day when the temperature is lowest. The small arteries and capillaries of the diseased portion of the lung would be more likely to rupture. Owing to the blood-vessels of the lungs not being supplied with vaso-motor nerves, an increase in the amount of blood passing through the lungs will be accompanied by an increase of blood pressure in the arteries. Anders [3] in his investigations has found that hæmoptysis is more common during the months of December, January, and February. My cases have been collected regardless of the season, but from my own observations I have noticed that hæmoptysis is more common among patients suffering from pulmonary tuberculosis during the winter months and during sudden changes of temperature.

In the treatment of hæmoptysis some years ago it was customary to apply ice-bags to the chest or over the affected lung, and to give the patient ice to suck. Through the absence of any good results this method of treatment has been abandoned almost altogether. It would appear from the above that it did more harm than good.

I am, Sir, yours faithfully,

WILFRID SMITH,
Jan. 27th, 1924. Assistant Tuberculosis Officer, Leicester.

GERMAN BATTLE OF THE CLUBS.

To the Editor of THE LANCET.

SIR,—It may interest you to learn that the struggle of German medical men against the Government decree of November, 1923, is not yet finally decided, although the essential part of this decree has been withdrawn. Many of the contracts with approved societies (Krankenkassen) do not terminate until the end of March, and it is not clear what will happen then. An Inquiry Commission now sitting in the Reichs-Arbeitsministerium represents panel doctors and approved societies, with three impartial persons, and has hopes of reaching an understanding. It is curious and unfortunate that the Vereinigte Sozialistische Partei (V.S.P.D.), unlike your Labour Party, is against the panel doctors, who have only the support of the communists, although employed persons generally are on the side of the doctors. Great indignation has been called forth by the fact that the medical men attached to the V.S.P.D. in Parliament have taken the part of the approved societies and are endeavouring to form a society of medical men in Berlin submissive to the will of the approved society executive.

Far-seeing people are convinced that unless some fundamental simplification of the German National Health Insurance is achieved, the system cannot be maintained. Insured persons at present pay 10 per cent. of their income in insurance, while the services rendered by approved societies and disablement insurance offices are far less than before the war. It has been calculated that in the larger towns there is one approved society official for every 500 to 700 insured persons, and to these must be added many officers of the *Versicherungsamt*, of the *Oberversicherungsamt*, the *Landesversicherung*, and the *Reichsversicherungsanstalt*. The enormous sums thus spent in administration are only to be explained by the historical development of the health insurance statutes. It is clear that health insurance can only be maintained by simplification upon the English model, for it is well understood here that the combination of insurance against disablement and disease is a great improvement on the German system.

I am, Sir, yours faithfully,

Berlin-Wilm., Jan. 25th, 1924. ROBERT GÜTERBOCK.

*** Dr. Güterbock's letter was written before he could have seen our summary of his article in the *Medizinische Klinik*. His letter may be regarded as a postscript to the comparative account of English and German Health Insurance given on p. 212 of our last issue.—ED. L.

BLOOD-COMPATIBILITY OF MOTHER AND INFANT.

To the Editor of THE LANCET.

SIR,—In the report of the proceedings of the Liverpool Medical Institute at its meeting on Dec. 20th last, appearing in THE LANCET of Jan. 5th, Dr. Norman Capon, discussing the question of transfusion in a paper on Hæmorrhagic Diseases of the New-born, is reported as having stated that "the mother is generally selected as donor and preliminary grouping is then not necessary." May I be permitted to point out that the implied assumption that the blood of mother and child are necessarily compatible is not justifiable; they may be, and frequently are, of different and incompatible groups. The fact that isoagglutinins do not usually appear in the infant's serum until some months after birth may render it possible to use any blood for transfusion, regardless of its group, without disastrous results in a young child, though, as there is no certainty when isoagglutinins may appear, this procedure cannot be regarded as entirely safe.

I draw attention to this matter because although, for the reasons put forth above, transfusion of an infant with the mother's blood, when incompatible, may be unattended by serious result, this would certainly not be so in the case of an older child.

I am, Sir, yours faithfully,

S. C. DYKE.
St. Thomas's Hospital, London, Jan. 22nd, 1924.

TUBERCULOSIS WORK IN ENGLAND.

To the Editor of THE LANCET.

SIR,—I am sorry to offer any criticism on Dr Salusbury MacNalty's able article on this subject in last week's issue of THE LANCET, but there is one paragraph I should like to comment on.

Talking of medical progress under the subheading of Artificial Pneumothorax, he says: "... this method of treatment may arrest the disease, or at all events prolong life, and should be practised more frequently than at present. I cannot speak with such eulogy of thoracoplasty, though favourable results are reported in a minority of cases."

His statements are quite true, but the truth is put forth in such a way as to give an impression quite different to what should be conveyed. Dr. MacNalty's "eulogy" of pneumothorax does not inspire, and the results of pneumothorax treatment *are* inspiring. Dr. J. Gravesen (medical superintendent, Vejlefor Sanatorium, Denmark) stated at the annual meeting of the British Medical Association at Portsmouth Tuberculosis Section,[1] that "A comprehensive view of these 211 third-stage cases (2 to 12 years after discharge) shows a lasting positive result of the pneumothorax in 38 per cent. of all cases in which a pneumothorax of any noteworthy extent could be established." Further, that when there were no adhesions, 70·2 per cent. were able to work.

[1] Fishberg: Pulmonary Tuberculosis, 3rd ed., p. 242.
[2] The Effect of External Temperature on the Circulation in Man, Journal of Physiology, vol. lviii., Nos. 2 and 3, Dec., 1923.
[3] Jour. of Amer. Med. Assoc., 1907, xlix., 1067.

[1] See THE LANCET, 1923, ii., 512.

Now look at Gravesen's statistics for thoracoplasty. Out of 105 patients 9 died from the operation; "43 were relatively cured or much improved, 21 improved." Of 69 patients discharged from two to seven years previously, 31, or 44·9 per cent., were fit to work. This, in truth, is a minority, but surely, considering what would have been the fate of these people, who were all advanced cases, this success deserves more "eulogy." Nor are Gravesen's figures exceptional; Bull's results are very similar, and my own experience—on a much smaller scale—has been equally happy.

I am, Sir, yours faithfully,

H. MORRISTON DAVIES,
Medical Supt., Vale of Clwyd Sanatorium.

Ruthin, North Wales, Jan. 28th, 1924.

KETOSIS IN CASUALTY PRACTICE.

To the Editor of THE LANCET.

SIR,—Without wishing to quibble with Dr. O. W. Roberts over terms of nomenclature, I think that a distinction ought to be made between cases of ketosis and those who merely exhibit ketonuria. The former condition is somewhat severe and comparatively rare, whereas the latter, in children, is a common accompaniment of many diverse conditions. No one has yet satisfactorily explained the mechanism of production of ketone bodies in the urine which can occur after anæsthesia, in starvation, in toxæmias and infections, and in certain metabolic explosions. Can any single theory cover all this ground? A comparison of results is therefore of interest and may stimulate inquiry into the ætiology of ketonuria; and I ask you to publish my clinical findings with that end in view.

I examined the urine of 316 in- and out-patients of the Bristol Children's Hospital, and as a control the urine of 112 normal school-children.

Of the 316 cases tested 116, or 36·7 per cent., showed ketonuria.
Of this 36·7 per cent. only 3·0 per cent. were cases of acetone body acidosis or ketosis.
The average age of cases tested was 6·1 years.
The average age of cases of ketonuria was 4·8 years.
Of the cases of ketonuria surgical cases gave 22·8 per cent., medical cases gave 49·2 per cent.; out-patient (total cases before operation) 28·0 per cent.
Of the medical cases 54·3 per cent. occurred in diseases of the respiratory tract; 23·2 per cent. occurred in diseases of the gastro-intestinal tract; 22·5 per cent. occurred in miscellaneous diseases.
The average duration of ketonuria was 2·6 days. There was pyrexia in 78 per cent. of all cases.
After general anæsthesia ketonuria occurred in 100 per cent. of cases.
After 24 hours complete starvation ketonuria occurred in 100 per cent. of cases.
The urine of 112 normal school-children (average age 10·7 years) was tested for acetone bodies. Number of positives, nil.

My findings are in close agreement with those of Dr. Roberts, especially with regard to the irritation of mucous membranes, and the higher incidence in the respiratory diseases was contrary to my expectations. There is undoubtedly some connexion between the catarrhal diathesis or hypersecretion of mucus, so liable to occur in childhood, and the onset of ketonuria; and this view is upheld by the fact that 28 per cent. of children with unhealthy tonsils or adenoids, who were presumably swallowing toxic mucus, were walking about all unknown with varying amounts of ketone bodies in their urine. The lethargy and somnolence of such cases may in part be explained by the action of ketone bodies on the central nervous system. And in addition the coexistence of pyrexia in 78 per cent. of all cases tested would rather tend to show that the outpouring of protective mucus or the stimulation of the anti-body mechanism has something to do with the appearance of ketonuria.

The efficacy of the treatment of ketonuria by sodium bicarbonate is probably due to the fact that that drug not only checks the secretion of mucus, but is a solvent of that already secreted. In passing I should like to repeat my statement which has already been published,[1] that ketonuria is met with in such metabolic upsets as asthma, eczema, migraine, eclampsia, and certain cases of epilepsy.

I am, Sir, yours faithfully,

Wellington, Salop, Jan. 28th, 1924. A. D. SYMONS.

[1] THE LANCET, 1922, i., 627.

THE HARD CASE OF AN UNREGISTERED DENTIST.

To the Editor of THE LANCET.

SIR,—May I ask you to insert my appeal in your estimable journal, so that I may state my case to all medical men, inasmuch as I have been deprived of my means of existence as the result of the new Dental Act?

I have lived in London since 1899 and have been practising as a dentist until 1917, and been respected and appreciated by my patients. I often gave free attendances for an hour or two in the morning to the poor who could not spare time to go to hospitals, and have many times made whole sets of dentures for some poor patients free of charge. During the war until 1917 I gave my services free to soldiers. Then I offered my services to the Government and was refused because I was too old, but as I wanted to do my bit in the war I went to Russia, and entered an army hospital as dentist in 1917, when Kerensky was in power.

Three months afterwards the Soviet came into power, and I was then compelled to serve in the Soviet Army as a dentist, where I went through such hardships and danger as I shall never forget. May I ask your indulgence to describe one incident? In 1919 our hospitals 41 and 48 received orders to evacuate. We were stationed in Orel and were expecting the enemy at any moment. We started to evacuate and had arrived near the town of Kaluga. There the train stopped in the middle of a field on account of the scarcity of locomotives, which were continually returning to bring up other carriages, and our echelon with the two hospitals and the medical staff was standing in the field nearly a month. At the beginning we received ¾ lb. bread per day; a week later we received ½ lb. per day; then we could not get any at all, and all our medical staff went rushing about the cropped fields looking for potatoes and white beetroot. We found very few, however, because the peasants had cleared everything away, having very little for themselves. In that year we could not manage to buy a pound of bread in the villages, so we tried to bake the beetroot, but it was bitter. We had to go a mile for water and carry it to our echelon. We had no tea or sugar, even of salt we only had ¼ lb. per month, and we all slept on bare dirty floors in the luggage wagons. That took place in the middle of October, 1919; it was already cold for the time of year, and snow had fallen. We had only summer clothing, and had to be out amongst all kinds of diseases and dying soldiers. Doctors and their assistants died, for typhus fever and many other diseases were raging, and although not ill myself, my sufferings were necessarily great until I was released from service. I arrived in London with great difficulty in every way and found the place where I now live. I sold everything left to me and I built up a practice, once more getting my old connexion back again.

Now I cannot be registered because I was not in practice in the United Kingdom up till 1921; although I have never committed any offence or had any claims from anybody during my whole life, and am now 70 years of age, yet I am not allowed to earn my living. Where is the humanity in making such a law? Skill is not considered at all. I am sure I am as well up in my profession as others. Why should I be deprived of my living? If I had any other means of making a livelihood I would turn to it. For this reason I appeal to all to have sympathy with me. Please write to the Dental Board to put my name on the Dental Register, so that I may continue to earn my living during the short time which remains to me.

I am, Sir, yours faithfully,

167, City-road, E.C., Jan. 24th, 1924. M. KAMM.

*** This is a very hard case. The Registration Committee has, however, been advised legally that it has no power to register the names of those who have not complied with the statutory conditions. Seeing how Mr. Kamm's default occurred we regret the impotence of the Registration Committee.—ED. L.

Medical News.

UNIVERSITY OF OXFORD: DEGREE DAYS.—Congregations will be held for the purpose of granting Graces and conferring Degrees in the present term on the following days, at 2.30 P.M.: Feb. 16th and March 6th and 29th.

ROYAL INSTITUTION OF GREAT BRITAIN.—On Feb. 5th, at 5.15 P.M., Prof. Arthur Dendy, F.R.S., will give his second lecture on What is Heredity? On Feb. 7th, at 5.15 P.M., Sir William Bragg, F.R.S., will give his first lecture on Crystalline Structure of Organic Substances.

RONTGEN SOCIETY.—A general meeting will be held on Feb. 5th, at 8.15 P.M., in the Institution of Electrical Engineers, Savoy-place, Victoria Embankment, London, W.C. A paper on the Recording of Action Currents in Nerve, with special reference to the use of the Cathode Ray Oscillograph will be read by Prof. H. S. Gasser. The Silvanus Thompson memorial lecture will be delivered by Prof. C. G. Barkla, F.R.S., on April 1st.

Mr. John Wheatley, Minister of Health, has appointed Mr. Douglas Veale, of the Ministry of Health, to be his private secretary, and Mr. A. N. Rucker to be his assistant private secretary.—Mr. Arthur Greenwood, M.P., Parliamentary Secretary of the Ministry of Health, has appointed Mr. H. H. George, M.C., to be his private secretary.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The programme for the month of February includes various special courses as well as a two weeks' intensive course from Feb. 4th to 16th at the North-East London Post-Graduate College (Prince of Wales's General Hospital, Tottenham). The programme will cover the whole day and will include all the general and special departments of the hospital, in addition to a special lecture by a member of the staff at 4.30 P.M. The special Combined Course on Children's Diseases will embrace lectures and clinical demonstrations on medical and surgical diseases of children (including special departments), and there will be two sessions daily from Feb. 4th to the 29th. The following hospitals will participate: Paddington Green Children's Hospital, Royal Waterloo Hospital for Children and Women, Victoria Hospital for Children, and the "Children's Clinic," Western General Dispensary. A further course in venereal diseases will be given at the London Lock Hospitals from Feb. 4th to 29th. The course will include clinical work daily in the wards and out-patient departments at both hospitals with a special lecture by a member of the staff each day. From Feb. 5th to 28th special clinical demonstrations will be given at the London School of Tropical Medicine by Dr. G. Low and Dr. P. Manson-Bahr on Tuesdays and Thursdays, at 2 P.M. The subjects considered will be the more important diseases of tropical countries, illustrated by cases in hospital.

HOUSING IN DUBLIN.—It is just ten years, our Correspondent writes, since a departmental committee of the Local Government Board of Ireland reported on the housing conditions of Dublin. At that time the committee found that one-fourth of the tenement houses of the city were "unfit for human habitation and incapable of being rendered fit for human habitation." At the same time one-fifth of the population were living in one-roomed tenements. Since then there has been no building in Dublin, dilapidation has gone on, and it is likely that control by the sanitary authority has not been more effective. That conditions have not improved is made plain by the medical officer of health for Dublin, Dr. M. J. Russell, in an interview recently given to the press. Owing to the shortage of houses, he says, families are living in houses in which normally animals would not be permitted to live. The overcrowding increases the spread of tuberculosis and persons leaving sanatoriums quickly relapse on returning to their overcrowded dwellings. The infantile mortality is also increased by the housing conditions. Dr. Russell's description of the sanitary accommodation is identical with that given by the committee ten years ago. The closets of the tenement houses are dirty, and there is no attempt at separate accommodation for the sexes. The proportion of the population living in one-roomed tenements has increased from one-fifth to one-third. As most of the tenements in Dublin are in old houses originally intended for one family, each room now housing one or more families, the condition of the woodwork of the floors is beyond description. "One would need," says Dr. Russell, "to see the floors of one of these rooms taken up to fully realise what a fetid atmosphere must constantly emanate from underneath, and there is nothing so injurious to the health of young children." The corporation cannot venture to close even the worst houses since no other roofs would be available to shelter those dispossessed.

SOUTH AFRICAN INSTITUTE FOR MEDICAL RESEARCH.—This Institute has benefited by donations amounting to £600 made to its research endowment fund. Of this amount £500 has been donated by the British South African Explosives Co., one of the constituent companies of the Nobel industries, and £100 by Sir Harry and Lady McGowan. Sir Harry McGowan is the chairman of the Nobel industries.

UNIVERSITY OF MANCHESTER: THOMAS GRAHAM COLLOID RESEARCH LABORATORY.—Mr. W. B. Hardy, secretary of the Royal Society, opened this laboratory on Jan. 23rd. The foundation of the laboratory, which is the first of its kind, is mainly due to the efforts of a number of business firms which have recognised the importance, scientific and industrial, of this complex branch of physico-chemical investigation. The laboratory has been named after Thomas Graham, Professor at University College, London, and Master of the Mint, who was the founder of the study of the colloidal state of matter. Mr. D. C. Henry will be in charge of the new laboratory.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 25 cases were considered and £299 voted to 23 applicants. The following is a summary of the new cases relieved:—

Widow, aged 67, of F.R.F.P.S. Glasg. who practised in Northamptonshire and died in 1906. Applicant has six children; the married daughters are unable to give monetary assistance but send clothes occasionally. The eldest son, a doctor, has largely supported his mother but is now only able to take locums and has five children of his own; he is only able to allow the applicant 5*s*. per week. The second son allows a similar amount. The applicant has had posts as housekeeper, but owing to her age and ill-health she is now unable to do the work. Voted £18 in 12 instalments.

Widow, aged 80, of M.R.C.S. Eng. who practised in Kent and died in 1881. Applicant mortgaged her property to start her son in business, but he died of consumption in 1915 before he could repay the loan. Then owing to the war she was unable to pay the interest and the mortgagees foreclosed, leaving her penniless. One married daughter has six children and is in reduced circumstances but allows her mother 10*s*. a week, the other daughter is a widow living on a small income and allows 35*s*. a week towards the expense of the applicant's board and necessary attendance owing to her advanced age. This second daughter asks the Fund to help as the allowance she makes is more than she can afford. Voted £26 in 12 instalments.

Daughter, aged 60, of M.R.C.S. Eng. who practised in France and died in 1884. The applicant has a superintendent's post at a G.F.S. Hostel at £50 per annum, but is much overworked and is in danger of breaking down. Voted £10.

Widow, aged 57, of L.R.C.P. Edin. who practised in Sheffield and died in 1911. This lady is in very bad health and has only received £4 10*s*. during the last 12 months by daily catering. This case was brought to the notice of the Fund by the C.O.S., who have been giving the applicant some help to pay her rent, which amounts to 7*s*. 6*d*. per week. Voted £10, and the C.O.S. have been asked to administer the grant.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, K.B.E., M.S., at 11, Chandos-street, Cavendish-square, London, W. 1.

ABERDEEN: JOINT HOSPITAL SCHEME.—An address on the joint hospital scheme was given by Dr. David Lawson, of Banchory, at a meeting of the Aberdeen Rotary Club on Jan. 25th. The scheme had been under discussion for some considerable time—a joint hospital comprising the accommodation of the Aberdeen Royal Infirmary, the Sick Children's Hospital, beds for tuberculosis patients, together with a pathology department and university class-rooms for students, was obviously greatly to the advantage of all concerned over the isolated buildings at present occupied. The site chosen was at Forresterhill, Burnside; 111 acres had been purchased for £35,000. Dr. Lawson went on to say that there was the possibility that a trust would present the site to the infirmary. In discussing the existing arrangements, he pointed out the total inadequacy of beds, not only at the Sick Children's Hospital, but also at the Aberdeen Royal Infirmary. 200 beds were urgently required for the Sick Children's Hospital; tuberculosis patients required 150 beds. The size of the waiting list of patients desiring admission to the infirmary in itself was a clear indication of the inadequacy of the present accommodation. Many surgical beds were occupied by emergency cases. One surgeon stated that 15 of his 22 beds were filled by such cases. Waiting lists steadily grew, and patients had to wait months for admission. This greatly militated against successful early treatment, and early treatment was essential for first-class surgical results. The new scheme provided for 500 to 600 beds for the infirmary. Class-rooms and a hostel were to be provided for students engaged in clinical studies. Prof. Ashley W. MacIntosh commented on the great difficulty in carrying out certain methods of treatment under the existing régime, instancing the treatment of diabetes by "insulin." Sir John Irvin moved a vote of thanks to Dr. Lawson. As chairman of the infirmary directors he also thought that the site would be presented to the infirmary when it moved to Forresterhill, and he understood a purchaser might be found for the present building.

GLASGOW UNIVERSITY.—The Senate has awarded Bellahouston gold medals to the following, who, having gained honours for the degree of M.D. in the year 1923, are, in the opinion of the Faculty of Medicine, worthy of this highest distinction for the excellence of their theses:—

Grace Hay Anderson: The calcium and phosphorus content of the blood in normal and rachitic children. John Norman Cruickshank: Syphilis and pregnancy.

JUNIOR EDINBURGH CLUB.—The fifteenth dinner of the club was held on Jan. 24th at the Boulogne Restaurant, Soho, with Dr. Hugh Paterson in the chair, when there was a large muster of members. Informal dinners are held monthly during the winter, and membership is open to all recent graduates of Edinburgh University. The hon. secretary is Dr. R. Scott Stevenson, 30, New Cavendish-street, W. 1.

THE LATE DR. JAMES HITCHCOCK.—The death occurred on Jan. 27th of Dr. James Hitchcock, of Gerrard's Cross, in his sixty-seventh year. He graduated M.B., C.M. at Aberdeen University in 1880, and was untiring in his devotion to his profession in the field of general practice. He published several articles in various medical journals, among them a prize essay on constipation in the *Practitioner*.

LONDON NEUROLOGICAL CLINIC.—The sixth annual dinner of the medical staff of the London Neurological Clinic (Ministry of Pensions) was held at Princes Restaurant, Piccadilly, on Jan. 26th. Between 40 and 50 past and present members took part. The guests included Lord Dawson of Penn, Lieut.-General Sir William Furse, Sir John Collie, Sir William Willcox, Sir Crisp English, Dr. Harry Campbell, and Dr. T. Beaton. In proposing the health of the Clinic, Dr. Laing Gordon spoke of the confidence of the staff in the future of psychotherapy, their enthusiasm for the cause of mental hygiene, and of the justification for these feelings found in the results of treating 15,000 cases grouped as "neurasthenia" and incipient mental disorder. He paid tribute to the enlightened policy of the Ministry in the care of the "shell-shocked," and to those who had guided it in the establishment and maintenance of the Clinic—in particular, Sir John Collie, Dr. W. A. Brend, and Dr. H. E. Davison. Sir Charlton Briscoe in the chair, in the absence of Dr. Davison, stated that the attendances of pensioners for treatment up to date amounted to over 200,000: and 51,000 had attended for diagnosis and the recommendation of suitable treatment. In replying for the Clinic, Sir Charlton Briscoe traced its growth from its birth in 1917 at Lancaster Gate. The toast of the guests, coupled with the names of Lord Dawson and Sir William Furse, was proposed by Dr. Travers Smith, who pointed out that if the need for psychotherapy amongst pensioners were decreasing, the success of the Clinic made all the more evident the urgent necessity for similar clinics for civilians. Lord Dawson, from his abilities, opportunities, and responsibilities, was generally regarded as the profession's spokesman and referee, and knowing his interest in the subject of team-work the profession would be well content to leave that of psychotherapeutic clinics in his hands. Lord Dawson said: "This Clinic is of value because it sets the pace, embodies an idea, carries it out well. Its repute has gone far and wide. It bears testimony to that widening reasoning which is ever spreading out over our profession and developing a power of working together which we did not exercise before the war." Lord Dawson then entered a plea for more coöperative work within the profession, and pointed out that the danger to be guarded against might be the risk to the individual spirit. "Anything which made us work according to pattern, turned us into officials rather than doctors, would tend to our destruction." Organisation must preserve adequate freedom for the individuality of the practitioner. Apart from its intrinsic value, the Clinic might be well worth preservation as a concrete object-lesson in what team-work should be. It was "an outstanding example, but we have still a lot to learn in the way of settling a clear policy and standing by it." Sir William Furse, speaking as the Regional Director and a layman, expressed his gratitude to the Clinic for its very valuable services to the ex-Service man.

DONATIONS AND BEQUESTS.—Mr. Henry Dixon Phillips, of Ipswich, left £250 to the East Suffolk and Ipswich Hospital; Mr. James Harris, of Swansea, left £100 to the Swansea Hospital; Mrs. Eliza Anne Glass left £500 to the Bristol Eye Hospital and £100 to the Bristol Royal Infirmary, and, subject to certain interests, the residue of the estate of the gross value of £32,636 is left as to one-third between the Bristol Eye Hospital and the Bristol Royal Infirmary.—Mr. George Cholmeley Cattlin, of Hove, who left £89,134, bequeathed £500 each to the Moon Society for the Blind, Brighton, the Society for the Relief of the Widows of Medical Men, Lloyds Benevolent Fund, the Sussex County Hospital, Epsom College, St. Bartholomew's Hospital, the London Hospital; £300 each to the Brighton, Hove, and Preston Dispensary, the Charity Organisation Society, Brighton Branch, the Surgical Aid Society, the Brighton, Hove, and Preston Dental Hospital, the Brighton, Hove, and Preston Throat and Ear Hospital, the Alexandra Hospital for Children, Brighton, and the Sussex Eye Hospital; £200 each to Dr. Barnardo's Homes, Hove Branch, St. Barnard's Home, Hove, the Royal Hospital for Incurables, Putney. The residue of his property, after various bequests and annuities, to the before-named charities pro rata in accordance with the amount of their legacies.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, W.

THURSDAY, Feb. 7th.—4.30 P.M., Papers to be read: J. W. Pickering, D.Sc., and J. A. Hewitt, Ph.D.: Further Experiments on the Action of "Peptone" on Blood, with Notes on the Significance of Surface Phenomena in the Problems of Anaphylaxis and Susceptibility. (Communicated by Prof. W. D. Halliburton.)—L. B. Winter and W. Smith: Studies on Carbohydrate Metabolism. I. Variations in the Nature of the Blood-sugar. (Communicated by Prof. F. G. Hopkins.)—E. C. Grey: The Latent Fermenting Powers of Bacteria. Parts I., II., and III. (Communicated by Prof. A. Harden.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Feb. 4th.

TROPICAL DISEASES AND PARASITOLOGY: at 8.30 P.M.

Paper:

Dr. J. Gordon Thomson: Recent Investigations in Rhodesia in Blackwater Fever.

Communications:

Dr. A. H. Skinner (Hankow): Schistosomiasis Japonica: the Diagnosis of Early and Mild Infections.

Mr. M. L. Treston (Burma): A Case for Diagnosis: (?) Anthrax Bacilli found in the Spinal Fluid in a case of Paralysis of the Lower Limbs.

Cases and Specimens:

Dr. J. B. Christopherson: (1) Cases of Actinomycosis in the Parotid Region from Teheran; (2) Actinomycosis, Granules Stained (from case shown).

Dr. Carlos Franca: The Intermediary Host of Schistosoma Japonicum in Formosa (*Blanfordia Nosophour formosana*).

Dr. Mendoza Guazon: (1) Bottle Specimen of Papillomatous Schistosomiasis of the Rectum (Philippines); (2) Section from Liver: Ascaris Infection.

Tuesday, Feb. 5th.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)

Cases will be shown.

Paper:

Mr. J. W. Dowden: The Principle of Early Active Movement as Applied to Fractures of the Upper Extremity.

PATHOLOGY: at 8.30 P.M.

Laboratory Meeting at 8.30 P.M. at St. Bartholomew's Hospital.

Demonstrations, &c.:

Dr. R. L. Mackenzie Wallis: Intermittent Cystinuria.

Dr. R. R. Armstrong: Experimental Prophylaxis of Sensitised Pneumococcal Vaccine.

Dr. M. Donaldson and Dr. R. G. Canti: (1) Demonstration of Microphotographic Incubator designed for the Study of the Action of Radium on Tissues growing in vitro; (2) Microscopical Demonstration: Carcinoma of the Cervix Uteri treated with Radium.

Dr. T. H. G. Shore: Demonstration: The Application of Gelatin to Museum Technique.

Dr. H. E. Archer: Demonstration: The Estimation of Blood Urea.

Dr. L. P. Garrod: Quantitative Method of Cultivating Fæces.

Sir Bernard Spilsbury: Demonstration: Rhabdo-myosarcoma.

Wednesday, Feb. 6th.

SURGERY: at 5.30 P.M.

Paper:

Mr. Grey Turner: Some Encouragements in the Surgery of Malignant Disease.

Thursday, Feb. 7th.

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.

Short Communications:

Mr. F. Winson Ramsay: Notes on a case of Normal Pregnancy after Operations for Ectopic Pregnancy on both Fallopian Tubes.

Dr. J. P. Hedley: An Unusual Case of Chorion Epithelioma (with specimen).

Dr. J. D. Barris: Dysmenorrhœa due to Hæmatometra in the Rudimentary Horn of a Bicornute Uterus.

Paper:

Mr. Comyns Berkeley, Mr. E. C. Dodds, and Mr. A. L. Walker: Some Chemical Observation on the Toxæmias of Pregnancy, with special reference to Hepatic Function.

Friday, Feb. 8th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.)
Cases:
Dr. Stanley Melville: Case for Diagnosis.
Dr. C. F. T. East: Case of Morbus Cordis.
Dr. Douglas Firth: Red-headed Albinos.

OPHTHALMOLOGY: at 8.30 P.M. (Cases at 8 P.M.)
Cases will be shown.
Papers:
Mr. Basil Lang: A Modification of the Usual Method of Extraction of Lens in Senile Cataract.
Mr. Malcolm Hepburn: A Classification of Affections of the Choroid.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Feb. 6th.—4 P.M., Dr. S. Vere Pearson: Pulmonary Tuberculosis—Early Diagnosis of the Disease.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEBRUARY–MARCH, 1924.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, Feb. 4th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Hemiplegia, Varieties and Localisation: Dr. Kinnier Wilson.
TUESDAY, Feb. 5th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Paralysis Agitans: Dr. Walshe.
THURSDAY, Feb. 7th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Post-encephalitic Conditions: Dr. Walshe.
FRIDAY, Feb. 8th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Recent Studies on the Vestibular Nerve: Mr. Sydney Scott.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, Feb. 4th.—12 noon, Neurosyphilis. I.: Dr. J. G. Greenfield.
The fee for the Course, including Pathology, is £5 5*s*. For those who hold Perpetual Tickets the fee is £3 3*s*.

COURSE OF LECTURES ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM will be given by Dr. Kinnier Wilson on Wednesdays and Thursdays at 12 noon, commencing Feb. 13th.
The fee for this Course will be £2 2*s*.
Dr. F. M. R. Walshe will give A COURSE OF EIGHT CLINICAL DEMONSTRATIONS, CHIEFLY ON METHODS OF EXAMINATION OF THE NERVOUS SYSTEM, in the Wards at 10 A.M., every Wednesday and Thursday during February. The numbers attending the Course will be limited. Fee £2 2*s*.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, Feb. 6th.—3.30 P.M., (I.) Papilloedema and Optic Neuritis: Mr. Leslie Paton.
The fee for this Course alone is £5 5*s*. If taken in conjunction with the general Post-graduate Course the fee is £3 3*s*. All applications should be sent to the Secretary, Medical School.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W. 1.
MONDAY, Feb. 4th, to SATURDAY, Feb. 9th.—Combined Course on Diseases of Children. Clinical Demonstration and Lectures from 10 A.M. to 4.30 P.M. daily, including the VICTORIA HOSPITAL FOR CHILDREN, the PADDINGTON GREEN CHILDREN'S HOSPITAL, and the ROYAL WATERLOO HOSPITAL.—CENTRAL LONDON OPHTHALMIC HOSPITAL. Clinical Lecture Demonstration every afternoon. Mon., 2 P.M., Mr. Oliver. Tues., 2.30 P.M., Mr. Gibb. Wed., 2.30 P.M., Mr. Neame. Thurs., 2.30 P.M., Mr. Cunningham. Fri., 4.30 P.M., Mr. Williamson-Noble (Pathological).—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars. Clinical Instruction in the Out-patient Department every afternoon from 2.30 P.M. Tues. and Fri., 5.30 P.M., Venereal Clinic.—LONDON LOCK HOSPITALS. Clinical work daily. Lectures at Dean-street as follows: Mon., 5 P.M., Mr. Gibbs: Anterior and Posterior Urethritis. Tues., 2.30 P.M., Mr. McDonagh: Treatment of Gonorrhœa and Its Complications. Wed., 5 P.M., Mr. Juler: The Commoner External Venereal Diseases of the Eye. Thurs., 4.30 P.M., Mr. Abel: Treatment of Acute Gonorrhœa in the Male. Fri., 4 P.M., Mr. Abraham: Treatment of Gonorrhœa in the Female.—LONDON SCHOOL OF TROPICAL MEDICINE. Tues. and Thurs., 2 P.M., Special Clinical Demonstrations.—NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N. 15. Special Intensive Course, first week Feb. 4th to 9th. Demonstration and Cliniques from 10.30 A.M. to 4 P.M. daily. Clinical Lectures at 4.30 P.M. Mon., Mr. Banister: Some Problems in Pregnancy. Tues., Mr. Gillespie: Diagnosis of Intermittent and Chronic Swellings of the Knee-joint. Wed., Mr. Benians: The Present Position of Vaccine-Therapy. Thurs., Mr. Carson: Difficulties in After-treatment following Operation on the Abdomen. Fri., Dr. Crookshank: Pathogeny and Treatment of Migraine.—WEST-END HOSPITAL FOR NERVOUS DISEASES, at 73, Welbeck-street, W. Mon., 1.30 P.M., Dr. Campbell: Facial Paralysis, Neuralgia, and Other Disorders of Peripheral Nerves. Tues., 5 P.M., Dr. Scripture: Speech Disorders in Nervous Disease. Thurs., 1.30 P.M., Dr. E. D. Macnamara: Epilepsy and Other "Fits." Fri., 5 P.M., Dr. Worster-Drought: Encephalitis Lethargica.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Feb. 4th.—5 P.M., Prof. K. Macfarlane Walker: The Internal Secretion of the Testis.
WEDNESDAY.—5 P.M., Prof. C. Max Page: The Surgical Treatment of Osteo-arthritis.
FRIDAY.—5 P.M., Prof. W. Heneage Ogilvie: The Infection of the Upper Alimentary Tract.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Feb. 4th.—10 A.M., Surgical Registrar: Surgical Anatomy. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Bishop Harman: Eye Dept.
TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards. 2.30 P.M., Dr. Pritchard: Medical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Owen: Medical Out-patients. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 11 A.M., Mr. Simson: Gynæcological Demonstration. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations and Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear..
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 7th.—4 P.M., Mr. Shires: X Ray Appearances in Diseases of the Joints.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Feb. 7th.—5 P.M., Mr. T. B. Davies: Acute Abdominal Pain in Pregnancy.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Feb. 5th.—5 P.M., Dr. Adamson: Streptococcal and Staphylococcal Eruptions.
THURSDAY.—5 P.M., Dr. J. L. Bunch: Tuberculosis.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, Feb. 6th.—4.30 P.M., Mr. P. P. Cole: Inoperable Cancer of the Uterus.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Feb. 4th.—(At the Children's Hospital.) Mr. Dun: Surgical Treatment of Tuberculous Glands.
TUESDAY.—(At the Southern Hospital.) Dr. Sanderson: Intrinsic Cancer of the Larynx and Ear and Nose Cases.
WEDNESDAY.—(At the Northern Hospital.) Dr. Leith Murray: Genital Prolapse.
THURSDAY.—(At the Stanley Hospital.) Mr. A Evans: The Acute Abdomen.
FRIDAY.—(At the Royal Infirmary.) Mr. Guthrie: Foreign Bodies in the Air- and Food-Passages.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
MONDAY, Feb. 4th.—4.15 P.M., Mr. S. R. Wilson: Recent Improvements in Anæsthesia.
TUESDAY.—4.15 P.M., Dr. A. Ramsbottom: Spastic Paraplegia.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURE. (At Whitworth-street West Branch.)
FRIDAY, Feb. 8th.—4.30 P.M., Dr. C. P. Lapage: Rheumatism and its Allied Infections in Children.

ANCOATS HOSPITAL LECTURES.
THURSDAY, Feb. 7th.—4.30 P.M., Dr. G. L. Langley: Early Cardiac Complications of Rheumatism.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES.
TUESDAY, Feb. 5th.—(At the Royal Hospital.) 3.30 P.M., Mr. G. Simpson: Hypertrophy of the Prostate.
FRIDAY.—(At the Jessop Hospital.) 3.30 P.M., Mr. Chisholm: Acute Abdominal Pain in Pregnancy.

Appointments.

DICK, Major C., late R.A.M.C., M.R.C.S., L.R.C.P. Lond., has been appointed Medical Superintendent of St. Mary's Hospital, Paddington.

HOSKIN, T. J., M.D. Camb., M.R.C.P. Lond., Assistant Physician, Royal Free Hospital.

HOWELL, B. WHITCHURCH, F.R.C.S. Eng., Consulting Orthopædic Surgeon to "Brookscroft" Voluntary Infant Welfare Centre, Walthamstow.

MACKENNA, R. W., M.D., Ch.B. Edin., Lecturer in Dermatology, University of Liverpool.

ODDY, H. M., M.B. Oxf., M.R.C.P. Lond., Assistant Physician to the Belgrave Hospital for Children.
WHARTON, J., M.D. Camb., Honorary Ophthalmic Surgeon, Manchester Royal Infirmary.
Surgeons under the Factory and Workshop Acts: GOVAN, G., M.B., C.M. Edin. (Cockermouth); LEGGE, S. B., M.D., Ch.B. Edin. (Shifnal).

Vacancies.

For further information refer to the advertisement columns.

Aylesford, Kent, Preston Hall.—Asst. M.O. £500.
Birkenhead and Wirral Children's Hospital.—H.S. £100.
Bedford County Hospital.—Asst. H.S. £130.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.S. £120.
Bournemouth, Holiday Home for Tuberculous Ex-Service Men.—Res. Med. Supt. £500.
Chesterfield and North Derbyshire Royal Hospital.—Jun. H.S. £150.
City of London Hospital for Diseases of the Heart, Victoria Park, E.—Radiologist.
Discovery Expedition.—S. £600.
Exeter, Royal Devon and Exeter Hospital.—Sen. H.S. £250.
Glamorgan County Mental Hospital, Bridgend.—Jun. A.M.O. £350.
Hampstead General and North-West London Hospital, Haverstock Hill, N.W.—Anæsthetist.
Hospital for Sick Children, Great Ormond-street, W.C.—Cas. O. Also Asst. Pathologist. Each £400.
India, Women's Medical Service.—Medical Woman. Rs.550 p.m.
Kent County Ophthalmic Hospital, Maidstone.—H.S. £300.
Leicester Royal Infirmary.—Second Res. Anæsth. £200.
London Lock Hospitals, 283, Harrow-road, W., and 91, Dean-street, W.—Hon. Ophth. S.
London (Royal Free Hospital) School of Medicine for Women.—First Asst. in Obstet. and Gynæcol. Unit. £700.
Lowestoft, St. Luke's Hospital.—Jun. Asst. M.O. £500.
Malay States.—M.O.'s. and Health O.'s. £616.
Manchester Hospital for Consumption, &c.—Res. M.O. £300.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Asst. Cas. O. £100.
Northampton General Hospital.—H.S. £150.
Nottingham General Hospital.—H.S. £200. Also Res. Cas. O. £250. H.P. £200.
Orkney, Parish of Eday.—M.O. £280.
Plymouth, Devon and Cornwall Sanatorium for Consumptives, Didworthy, South Brent.—Res. Med. Supt. £550.
Queen Mary's Hospital for the East End, Stratford, E.—Hon. Asst. P.
Royal Earlswood Institution, Redhill, Surrey.—Jun. Asst. M.O. £250.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Three Hon. Anæsthetists.
Salford Royal Hospital.—Pathological Asst. £260. Also Lady Supt. of Nurses. £250.
St. Marylebone Hosp., Ladbroke-grove, W.—Third Asst. M.O. £300.
St. Thomas's Hospital.—P. to Out-patients.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Cas. O. and Reg. £150.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg., Hon. Surg. Reg., and Hon. Obstet. Reg.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Barnet, Herts; Peasenhall, Suffolk; St. Blazey, Cornwall; Crewkerne, Somerset.

Births, Marriages, and Deaths.

BIRTHS.

BURNHAM.—On Jan. 26th., the wife of C. Burnham, M.B., Ch.B., F.R.C.S.E., of a daughter.
CARNEY.—15th Jan., at Errigle, Cootehill, Co. Cavan, the wife of Major P. Carney (late R.A.M.C.), of a son.
REID.—On Jan. 11th, at New Barns, Yalding, the wife of Captain S. D. Reid, R.A.M.C., of a daughter.

MARRIAGES.

COPP—FENTON.—At Holy Trinity, Sloane-street, on Jan. 22nd, Evelyn May, the elder daughter of the late Rev. Charles Copp, Silverton, Devon, to Henry Felix Fenton, Medical Superintendent, Worcester County and City Mental Hospital, son of the late Dr. H. A. Fenton, of Hatfield, Nth. Doncaster.

DEATHS.

BALE.—On Jan. 27th, at 5, College-gardens, London, N., Henry James Bale, Founder and Managing Director of Bale, Sons and Danielsson, Medical Publishers, aged 76 years.
CREAGH.—On Jan. 18th, at Grangewood Lodge, Netherseal, William Creagh, Brigade Surgeon-Major, attached Royal Horse Artillery, third son of the late Lieut.-General James Creagh, in his 86th year.
DE JONG.—On Jan. 18th, from pneumonia, Oscar de Jong, M.B., Ch.B., D.P.H., of Rodney-street, Liverpool.
MACNICOL.—On Jan. 26th, at Queen Alexandra's Military Hospital, Millbank, Major Robert Henston MacNicol, R.A.M.C.
SHULDHAM.—On Jan. 23rd, at Priory-court, N.W., Edward Shuldham, M.D., M.A. Oxf., aged 86.
SMITH.—On Jan. 26th, at Ranelagh-avenue, Hurlingham, John Alexander Smith, L.D.S. Eng., in his 86th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE HISTORY OF PERCUSSION AND AUSCULTATION.[1]

BY SIR WILLIAM HALE-WHITE, M.D., F.R.C.P. LOND.

IN the investigation of disease we doctors probably use percussion and auscultation more than any other means, yet had this meeting been held a hundred years ago it is most unlikely that a single person present would have known anything about them, for they had only come into use four or five years before in France, and Forbes's translation of Laënnec's book was not published in England until 1821.

Leopold Auenbrugger and Percussion.

Percussion we owe to Joannes Leopold Auenbrugger (1722–1809), who studied medicine at the University of Vienna, one of his teachers being Baron von Swieten. Auenbrugger appears to have early shown a talent for observation, and obtained his doctor's degree in 1752. The little book of 95 pages on which his fame rests was first published in 1761; a second unaltered edition appeared in 1763. It is written in Latin, and the pages are so widely spaced that the whole book only contains about 7000 words—that is to say, it could all appear in five or six pages of THE LANCET. It is entitled "Inventum Novum ex Percussione Thoracis Humani ut Signo abstrusos interni Pectoris morbos detegendi." The text consists of 48 sections, each numbered; these are grouped, not into chapters, but into "Observations"; there are 14 such groups. After most of the sections there appears a Scholium or Annotation. Thus:

"OBSERVATION II.

On the Method of Percussion.

IV.

The thorax ought to be struck, slowly and gently, with the points of the fingers, brought close together and at the same time extended.

Scholium

Robust and fat subjects require a stronger percussion; such, indeed, as to elicit a degree of sound equal to that produced, by a slight percussion, in a lean subject."

Statements of great importance were that disease exists if the percussion note is different in similar places on the two sides, and if it is on both sides equal but diminished in intensity; that the superficial extent of the unnatural sound in a sonorous region is commensurate with the extent of the morbid affection; that if the same results are obtained both before and behind, on points precisely opposite, the disease occupies the whole diameter of the chest. Corvisart justly says nothing can be clearer, more precise or more true, than the preceding paragraphs. Auenbrugger then tells us that a morbid sound always accompanies a copious effusion of fluid in the thoracic cavity; that such a sound perceived during the course of acute diseases of the chest, occurs most frequently in inflammatory affections—the duller the sound the more severe the disease, the more extensive the dull sound the greater the danger. The ninth observation is entitled "Of the appearances on dissection, in cases in which the preternatural sound of the chest has been observed." These are the following: (1) Scirrhus of the lungs; (2) the conversion of this into an ichorous vomica; (3) a purulent vomica (simple or ruptured), in the pleura, lungs, mediastinum, or pericardium; (4) empyema; (5) Dropsy of the chest in one or both cavities; (6) dropsy of the pericardium; (7) extensive extravasation of blood in the cavity of the pleura or pericardium; (8) aneurysm of the heart. Corvisart's commentary on this is worth quoting: "Of the surpassing importance of a knowledge of these no one can doubt; and when it is considered that percussion—and percussion alone—can make us acquainted with them, we cannot sufficiently applaud those men who have enriched this, the most difficult department of medicine, with a kind of knowledge at once so scientific and satisfactory."

It is strange to see that in 1761 so distinguished a physician as Auenbrugger gathered together all varieties of solidification of the lungs under the one word scirrhus, and that all varieties of cardiac dilatation were included in the phrase "aneurysm of the heart." We have here an indication of the backwardness of medicine at that period, but it is interesting to observe that he knew that a phthisical cavity gives a dull note, and, greatly to his credit, he not only discovered percussion, but also knew from dissection the diseases in which the dull note is given. The remaining observations are occupied with the symptoms of these eight

[1] An abstract of an address delivered before the Midland Medical Society at Birmingham.

conditions. Short as his little book is, it might be much condensed, for Auenbrugger's fame rests on the few paragraphs in which he announces the discovery of percussion, states where in health the note is sonorous, where it is dull, and teaches us in what diseases it is dull.

Reception of Auenbrugger's Work.

There is no doubt that Auenbrugger's work did not fructify until Corvisart published his admirable commentary. This was due to two causes: Auenbrugger was a court favourite and his jealous colleagues would not pay attention to his discovery; also, he did nothing to help the seed to grow. There is no evidence that he was, like Laënnec, a great teacher who by lecture and bedside demonstration was always forwarding his discovery, or that he was a great physician interested in all branches of medicine. He appears rather to have the good luck to hit upon the discovery of new means of diagnosis. As far as we know, only two people of importance took any interest in Auenbrugger's book during his lifetime—namely, Albrecht von Haller and the Leipsic professor, Christian Gottlieb Ludwig. Letters written by Auenbrugger to Haller exist, as also does one of condolence to Haller's son on the death of the great physiologist. But neither of these two famous men did much to further the discovery of percussion. Speaking generally, the discovery fell dead, as will be seen by reference to Neuburger's recent work [2] on Auenbrugger.

In France in 1770 Rozière de la Chassagne published, with a work of his own, "Manuel des pulmoniques, ou Traité complet des maladies de la poitrine," a translation of Auenbrugger's book, but this, too, attracted no attention. But in 1788 Corvisart, having heard of Auenbrugger's discovery, began to practise it. In 1808, a year before Auenbrugger's death, Corvisart published a translation of the "Inventum Novum," praised the method, and added commentaries of his own, so that the little book of 95 pages became one of 440. This remarkable book shows that Corvisart fully understood the art of percussion, and wherever Auenbrugger is correct he is awarded unstinted praise; where his knowledge of medicine is at fault he is corrected. Laënnec was enthusiastic in praise of percussion, saying, "La percussion de la poitrine est, sans contredit, l'une des découvertes les plus précieuses dont la médecine se soit jamais enrichie." Thanks primarily to Corvisart, but largely to Laënnec, Auenbrugger at last gained, not in his own country, but in France, the recognition due to a great discoverer. In Great Britain he was introduced to the profession by John Forbes, who in 1824 published "Original cases with dissections and observations illustrating the use of the Stethoscope and percussion, in the diagnosis of Diseases of the Chest," which book contained a translation of Auenbrugger's original treatise and a selection of Corvisart's commentaries.

Laënnec and Auscultation.

Auscultation was discovered by René Théophile Hyacinthe Laënnec, who was born at Quimper in 1781. His father was temperamentally quite unfit to look after a family, and Laënnec owed his opportunity in life to a paternal uncle, Guillaume, a physician of high intelligence, learned and industrious, who studied in England under Hunter and became Rector of the University of Nantes.

Young Laënnec.

He entered at the School of Medicine at the Hôtel Dieu, Nantes, in September, 1795, being then 14½ years old. It is an indication of the times to find that in the same month he was appointed military surgeon of the Third Class. In 1800 he received the appointment of Officier de Santé and accompanied the expedition sent to quell the insurrection in the Morbihan district. In that year he should have gone to study medicine in Paris, but lack of money prevented him until, in 1801, thanks to his uncle, enough was wrung from Laënnec's father to enable him to do so.

What he did during the remaining 25 years of his life would in any circumstances arouse our wonder, but his accomplishment appears marvellous when we remember that two millstones hung round his neck. The first was his wretched health; he suffered from asthma, angina, neurasthenia, and later from phthisis, and more than once he nearly gave up his career in Paris for a life in the country. The second was his father, whom at last he had partially to support. When Laënnec entered the Ecole de Médecine there were in Paris two schools of thought: that of Pinel, at La Salpêtrière, was the more popular, but was theoretical and interested chiefly in the classification of disease; the other, headed by Corvisart at La Charité, took morbid anatomy as its foundation. The latter attracted Laënnec, and he entered as a student at La Charité, becoming there a fast friend of Bayle. He was a great taker of notes, and during his first three years drew up a minute history of nearly 400 patients. He, Bayle, and Dupuytren were all enthusiastic in the study of morbid anatomy and decided to write a book on the subject, but the project fell through; Laënnec then determined to write one himself, but never completed it. His earliest publication was a description of a case of mitral disease published in 1802.

In September, 1803, he was awarded the Grands Prix in both surgery and medicine. His surgical commentary has been preserved; the subject is axillary aneurysm, for which he favoured amputation at the shoulder. In 1804 he presented a thesis on the application of the doctrines of Hippocrates to practical medicine and four days later received his diploma. The thesis, dedicated to his uncle Guillaume, was printed and attained great success. In his first year of private practice he earned 150 francs, in the second 400; by 1813 he was earning 10,000 francs a year from practice and had attained the position of a fashionable physician. Nevertheless, he continued to work hard in the wards and at the science of medicine, particularly morbid anatomy, so that by the age of 25 he was generally recognised as a chief among morbid anatomists. His power of work was prodigious, for in addition to his medical activities he studied the Breton language, including its relationship to Cornish, Erse, and Gaelic. In 1814 the Parisian hospitals were full of soldiers; Laënnec put those from Brittany, who spoke no French, in separate wards, himself looking after them.

All this time he was perfecting the art of auscultation in the wards of the Necker Hospital; in February, 1818, he read, before the Academy of Sciences, an account of his new method of investigating the respiratory and cardiac sounds, and later on in this year he gave four lectures on the same subject. A few months later still he was able to announce his discovery of ægophony and pectoriloquy. But it is quite likely that all he had done would have remained buried if he had not gathered his observations into that masterpiece "De l'Auscultation Médiate ou Traité du Diagnostic des Maladies des Poumons et du Cœur fondé principalement sur ce nouveau moyen d'exploration," published in two volumes in Paris during August, 1819, at the price of Fr.13. The publishers gave him 7000 francs for the first two editions. A stethoscope cost 3 francs.

In 1818 and again in 1819 Laënnec was very ill; for two years he lived in Brittany, returning to Paris in better health for a further four and a half years of strenuous work. In December, 1821, he started a course of clinical instruction at the Necker Hospital; in 1823 he took charge of the clinic at La Charité; his rounds began at 10 A.M. on five days a week and each lasted two hours. About 50 learners accompanied him, among them many foreigners, for his reputation was European. Most of the time he talked in Latin and he wrote his observations on the cases in this language. In August, 1822, he was elected professor and royal lecturer at the College of France, a post he held till he finally left Paris. Private patients flocked to him in such numbers that he had to restrict himself to consulting practice. He entirely re-wrote his book, publishing a second edition; and in 1821 he married. His health got worse and worse; he recognised that he had phthisis, and in May, 1826, he left Paris for Brittany, where he died in August of the same year.

Laënnec, although he was never actually in England, appears making stethoscopes in Kipling's "Marklake Witches."

"I saw him (René) and Jerry sitting on the seat and playing with wooden toy trumpets . . . They weren't real trumpets because Jerry opened his shirt collar, and René put one end of his trumpet against Jerry's chest, and put his ear to the other. Then Jerry put his trumpet against René's chest, and listened while René breathed and coughed.

"'This holly wood is one of the best,' said Jerry. 'Tis wonderful like hearin' a man's soul whisperin' in his innards but unless I have a buzzin' in my ears, Mosheur Lanark, you make much about the same kind of noises as old Gaffer Macklin—but not quite so loud as young Copper. It sounds like breakers on a reef—a long way off. Comprenny?'

"'Perfectly,' said René. 'I drive on the breakers. But before I strike, I shall save hundreds, thousands, millions, perhaps, by my little trumpets.'"

The Discovery of Auscultation.

In the first edition of Laënnec's book we are told, in the following words, how he was led to the discovery of mediate auscultation.

"In 1816 I was consulted by a young woman presenting general symptoms of disease of the heart . . . The patient's age and sex did not permit me to resort to the kind of examination I have just described (i.e., direct application of the ear to the chest). I recalled a well-known acoustic phenomenon—namely, if you place your ear against one end of a wooden beam the scratch of a pin at the other extremity is most distinctly audible. . . Taking a sheaf of paper I rolled it into a very tight roll, one end of which I placed over the præcordial region, whilst I put my ear to the other. I was both surprised and gratified at being able to hear the beating of the heart with a much greater clearness and distinctness than I had ever done before by the direct application of my ear."

Then follows an account of his experiments as to the best material for making stethoscopes; he finally found that

[2] Leopold Auenbrugger's Inventum Novum. Max Neuburger. Vienna and Leipzic, 1922.

wooden cylinder with a tube bored down its long axis was the best, the tube being expanded into a funnel-shaped depression at one end. He next tells us how to use the instrument.

Part I. of the book treats of the investigation of the voice sounds by the stethoscope. Laënnec was struck by a most singular phenomenon in a young woman 28 years old, for on listening to the stethoscope applied to a spot under the middle of the right clavicle "her voice seemed to issue directly from the chest and to pass unaltered through the central canal of the instrument." He found this sign in 20 other hospital patients and in all who died a cavity was present where the pectoriloquy, for so he called the sign, had been heard. Thus the discovery of pectoriloquy and its significance was made. Later on, in the chapter on pulmonary phthisis, he tells us that that he "examined post mortem 200 phthisical subjects . . . and on no single occasion failed to find cavities in any part of the lung over which pectoriloquy had been clearly audible." Therefore, he says, "pectoriloquy is a true pathognomonic sign of phthisis."

In Chapter 4 of Part I. he announces the discovery and meaning of ægophony, which resembles pectoriloquy. The voice appears high-pitched, sharp, and silvery, and is quavering and jerky, like the bleating of a goat. He says, "its occurrence appears to me to be restricted to subjects suffering from acute or chronic pleurisy, with a limited amount of effusion in the pleural cavity."

In Part II. we find an account of the investigation of respiratory sounds by the stethoscope as accurate and true to-day as when he wrote it. Part III. begins with an account of râles. They are classified as (1) moist râle or crepitation; (2) mucous râle or gurgling; (3) dry sonorous râle or snoring; (4) dry sibilant râle or whistling. We are told that dry sonorous râles "not infrequently resemble the cooing of a dove. This resemblance is often so close that one is tempted to believe that a dove is hidden under the patient's bed."

The greater part of the two volumes is occupied by diseases of the lungs, but consideration is given to the stethoscopic examination of the heart. Laënnec always supports his statements by illustrative cases, of which the appearances during life and after death are admirably described.

The Place of Laënnec in Medicine.

Before the beginning of the nineteenth century, medicine was almost entirely either empirical or dominated by metaphysical conceptions. Laënnec's book came as a revelation, causing the scales to fall from the eyes of doctors; it taught them that medicine, like other sciences, rests on observation and experiment. He and a few other great men have had the power of observation exalted to such a degree that it becomes genius, a rare gift far less common than high thinking. Verily does Sydenham say: "True practice consists in the observations of nature; these are finer than any speculations." In this astonishing book there occur perfect, precise, and original descriptions of clinical symptoms and post-mortem appearances, neither too long nor too short, for the most part as true now as on the day they were written. Many of them refer to conditions till then unknown, or at least not properly appreciated, such as pulmonary tuberculosis, pneumonia, pulmonary apoplexy, pulmonary œdema, pulmonary gangrene, emphysema, bronchiectasis, hydrothorax, pneumothorax, and some forms of cardiac disease. Laënnec had the power which enabled him to combine isolated observations as to see what they indicated when grouped together; not only did he draw accurate and vivid pictures of the signs and symptoms of particular diseases, but by carrying his gift for clear vision into the post-mortem room he showed that it was possible to predict from observations made during life what would be found after death. He may be said to have been one of the founders of the clinical-morbid anatomy method of studying disease, which, although other methods have since been added, still remains the corner-stone of medicine.

TALKS TO MOTHERS.[1]

WE have received a further instalment of the excellent leaflets by Miss Lily Skene, with the above title, these including Nos. 3 to 6 in the two series dealing respectively with infant care and with character training. While the style in which the leaflets are written is homely, the advice given is uniformly good. The new leaflets on infant care include talks on the care of the premature baby, on summer diarrhœa, on the causes and prevention of constipation, and on the causes and prevention of sickness and loose stools, while the "character" series deal with such topics as unselfishness, honesty, and patience. The practical character of the teaching and the simplicity of the language—to say nothing of the modest price—should ensure for these little papers the wide popularity among nurses and health visitors which they deserve.

[1] Series I. and II., Nos. 3–6, inclusive. By Lily Skene. London: John Bale, Sons, and Danielsson. 1923. 2*d.* each.

COLONIAL HEALTH REPORTS.

St. Helena.

THE estimated civil population on Dec. 31st, 1922, amounted to 3658. The birth-rate in 1922 was 25·88 per 1000, as against 25·3 in the previous year. The death-rate was 9·87 per 1000, as compared with the exceptionally low rate of 6·5 in 1921; this may be taken as working back to the average of about 8·5 per 1000. The general health of the community continued to be satisfactory; influenza of a mild type prevailed in the months of January and February to a moderate extent. A case of measles, complicated by appendicitis, was landed from a mail steamer in January and taken to the hospital, and a severe case of diphtheria occurred in Jamestown in March, but no further cases followed in either instance. A medical examination of all the island children was carried out during the year. The town school-children showed a lower state of nutrition than those in country schools. The proportion of children showing defective teeth would compare most favourably with similar children in England. The vast majority of younger children showed excellent teeth. Cases of enlarged tonsils and adenoids were conspicuous by their absence. There were 174 admissions to the hospital (as compared with 197 in 1921), and there were four deaths. The mean temperature for the year was 61·1° F. The total rainfall measured at Hutts Gate was 42·83 inches, at Plantation 37·12 inches, and in Jamestown 7·55 inches.

New Hebrides.

Mr. M. King, C.M.G., the British Resident Commissioner, in his report to the Colonial Office for 1921–22, explains that the New Hebrides, to which are attached the Banks and Torres Islands, have an area of about 5700 square miles. The natives are Melanesians, but in places there is a mixture of Polynesian blood. A joint naval commission was established in 1888, by agreement with France, to protect the lives and property of British and French subjects and to maintain order. By a Convention of 1906 a condonium was set up with a joint court composed of British and French judges and a neutral president, and an executive government consisting, for some purposes, of the British and French representatives in the group acting in concert. For other purposes British and French nationals remain subject to the control only of their national authorities. The British and French Resident Commissioners are subordinate to the High Commissioner for the Western Pacific and the High Commissioner at Nouméa respectively. A memorandum contributed by Dr. G. Vernon Davies, D.S.O., medical superintendent of the Paton Memorial Hospital, Vila, states that the following diseases are endemic: tuberculosis, malaria, filariasis, amœbiasis, and yaws. These five are, with pneumonia, to which the native is very subject, the chief causes of sickness in the group. Cerebro-spinal fever, influenza, whooping-cough, and mumps have appeared in epidemic form either in 1921 or 1922. The group appears to be free from enteric, plague, cholera, small-pox, yellow fever, bacillary dysentery, and diphtheria. Tuberculosis is the most serious disease that the natives are infected with; it accounts for one-third of all deaths that occur in the hospital. Besides the pulmonary disease, which is the most common, inflammation of the cervical glands is often met with. These show a tendency to very early suppuration. Tuberculous joints and meningitis also occur commonly. The habits of the natives, with a large family living and sleeping in a one-roomed grass house, provides an ideal means of spreading the infection. Malaria is the most widespread disease. Judging by the size of spleen in the native babies few of these escape. All natives are subject to it throughout their lives, but the value of quinine is becoming more recognised throughout the native population, and it is now in demand by all who have seen its good results. Among non-natives malaria is the greatest cause of ill-health, the majority of Europeans suffering from it at intervals. Blackwater fever occurs among Europeans in some islands, notably Epi. Filariasis is distributed throughout the group, but the incidence in the population varies very much in different parts. In some villages in Malekula, between one-third and one-half of the people are suffering from elephantiasis. Muscular swellings, many of which go on to abscess formation, occur very frequently among the natives, and are an important source of ill-health and incapacity. These are probably of filarial origin, though this is one of the things requiring investigation. One or two cases of filaria have occurred among the white population. Amœbiasis remains epidemic throughout the year, but shows a distinct tendency to be epidemic in January and February when flies appear at their worst. It is an important cause of death, attacking and proving fatal in all ages down to infancy. However, the people are recognising the good results that can be obtained with emetine, and it is usually one of the diseases that they will come to the hospital for when they are within reach of attention. It is difficult to

estimate the extent to which yaws exists among the native population. Few babies seem to escape, and sequelæ are seen in several forms among the adults. Gangosa is very often seen. A form of periostitis is very common. It seems to be described as a complication of yaws, but has occurred in Europeans after several years' residence who have had no sign of the primary disease. The tibia is the bone most often affected, but almost any bone seems subject to it, especially those forming the elbow-joint. The neosalvarsan drugs, which are so efficacious in the other manifestations of yaws, seem to have little influence on it, but it responds to potassium iodide. This bone lesion occurs in about 10 per cent. of the people in some villages. Besides the diseases mentioned there are others which do not occur so frequently. Tetanus appears from time to time. Leprosy is scattered about the group, and probably not one of the larger islands is without it. So far these cases have not been isolated or treated except on one island. Syphilis appears to be very rare, but gonorrhœa is becoming increasingly common; ulcerating granuloma is also met with. Tropical ulcer is very prevalent, and this and scabies are the only two skin complaints that interfere with the efficiency of the native. Hookworm has never been investigated in the group, but if this were done it is probable that, as in other islands, a large percentage of the natives would be found affected. Dr. Davies adds that these notes "are based on clinical grounds only, as so far little has been done here in the way of investigating disease. . . . . It is to be hoped that before long the fact that these islands are still virgin soil pathologically will attract a small laboratory."

A HOBBY FOR NATURE-LOVERS.

THE convalescing patient who has been ordered a prolonged sojourn in the country often finds his interest flagging through lack of a suitable hobby. Golf demanding too great an effort, the days must perforce be spent in gentle rambles among the fields and woods, which all too soon, for the average city dweller, become objectless and dull. A medical man, himself in poor health, tells us of the benefit he found in the occupation of jotting down in a diary short notes about trees, wild flowers, garden flowers, birds, and insects. "This becomes a most fascinating pastime," he writes, "if it is pursued, not in an aimless fashion, but in association with the Phenological Committee of the Royal Meteorological Society. This committee issues yearly a very simple printed form of questions on which the dates of first noticing the appearances of certain plants, birds, and insects can easily be entered. Attention may be confined to one particular set of phenomena, and in some cases two or more friends might unite in filling up a schedule. The expense is limited to the cost of postage, and correspondents sending a sufficient number of observations are supplied gratis with a copy of the annual report. Further particulars may be obtained from one of the hon. secretaries of the committee, at Chartham Park, East Grinstead, Sussex." We recommend this purposeful hobby to practitioners as a suggestion in prescribing for the empty hours of convalescence.

HEROIC TREATMENT FOR HUNTERS.

WE have received from Mr. R. W. Burkitt, F.R.C.S. Irel., of Nairobi, a pamphlet of 24 pages on the treatment of disease for officials, missionaries, settlers, soldiers, and hunters in out-of-the-way parts of Africa remote from a doctor. Five subjects are dealt with—namely, malaria, blackwater, pneumonia, dysentery, and sun. The author's intention to give useful information for intelligent treatment at the early stages of certain diseases is sound enough, but the recommendations transgress the limits permissible for non-medical efforts. As an instance may be quoted some of the advice given as to the diagnosis and early treatment of pneumonia. ". . if the chest is struck smartly with the fist, a spot will be found which causes pain—later on there will be a bloody spittle coughed up." It is then recommended "if he is seen early in the disease, if he be an adult with a normal quantity of blood, he should be bled at once, a pint from one of the big veins of the elbow," further details of the operation being supplied. This and other advice seems to us too heroic to put into the hands of non-medical and non-critical readers.

THE INVESTIGATION OF MOSQUITOES IN ENGLAND.

TILL recently the investigations of the local government boards upon malaria contracted in England in 1917 dealt primarily with the well-known species of anophelines indigenous to Britain—*A. maculipennis* and *A. bifurcatus*. It was then suspected that an elusive tree-hole breeding species, *A. plumbeus*, was capable of transmitting malaria, a suspicion confirmed by laboratory experiments conducted at the Liverpool School of Tropical Medicine. This led to an inquiry addressed to the South-Eastern Union of Scientific Societies [1] upon the range and habits of this species. This work was materially assisted and stimulated by the late Mr. Arthur Bacot to whom a well-deserved tribute is paid. *A. plumbeus* is fairly common in Epping Forest as well as in Richmond Park; the adult insects being found most abundantly in the autumn months, even as late as November. The eggs are laid singly in holes in trees, especially beeches and hornbeams; the half-grown larvæ live throughout the winter. This species has been recorded from various localities in Surrey, from Gloucestershire, and the Isle of Man, and is probably very generally distributed throughout England. There are believed to be two broods in the year. *A. plumbeus* is a timid mosquito, which feeds voraciously on man if undisturbed, but is easily driven off. Probably in nature its normal hosts are birds and small mammals. It will be readily understood that the secretiveness of the habits and the often inaccessible situation of its breeding places render this mosquito most difficult to eradicate.

[1] Transactions of the South-Eastern Union of Scientific Societies, 1923, xxxviii. Preface by Clarence Tierney, D.Sc.

ROYAL ALBERT INSTITUTION, LANCASTER.

THIS charitable foundation was instituted in 1864 for the feeble-minded of the Northern Counties, mainly through the efforts of a former Lancaster physician, Dr. Edward Denis de Vitré. The fifty-ninth annual report contains an interesting retrospect of its history during over half a century and a statement of its present position, together with projects for its extension. During the year, on Sept. 28th, 1923, the quinquennial festival was celebrated and the foundation-stone of a new reception house to take the place of one now used as a tuberculosis sanatorium was laid. Two Commissioners of the Board of Control visited the institution in May, 1923, and commended the excellent work that was being carried on. The report points out that whereas on the occasion of the first quinquennial festival, held in 1873, there were only 141 patients resident, there are now 800 with a prospect of considerable addition when new buildings have been provided for custodial cases. The income in 1873 was £5523, to-day it is £55,042. Altogether 4200 patients have been dealt with in the institution since 1870, four-fifths being reported as improved, in many cases to the extent of earning their own living under kindly supervision, though in the majority even of improved cases discharged from the institution "after care" is essential for the maintenance of permanent benefit. Acknowledgments are made to the various local organisations for raising funds, and the retirement of Sir Charles Brown, for more than 50 years the hon. secretary of the Preston Committee, is chronicled with regret. The training in the workshops (for some dozen trades) has been very successful, and the farm and garden land now consists of 277 acres on which some of the older patients are usefully employed.

The report of Dr. W. H. Coupland, the medical superintendent, for the year ending March 31st, 1923, shows a total of 118 patients admitted, 36 discharged, and 19 died out of a daily average of 760 residents, equivalent to a death-rate of 2·5 per cent., the largest mortality being due to pneumonia in conjunction with influenzal and tuberculous infections. It is stated that for the previous year 1921–22 the death-rate was exceptionally low—only 4 of either sex. Reference is made to the question of the propriety of admitting to institutions under the Mental Deficiency Act patients who have suffered from encephalitis lethargica, and Dr. Coupland expresses the view that "if the damage to the brain is obviously permanent and the children are not above the age of 15 years, then it is justifiable to certify them under the Mental Deficiency Act." As a clinical interest, attention is called to a curious mal-development of the neck and upper thorax existing in one of the female patients as an example of the condition which has been described under the title "les hommes sans cou," but for which Sir Arthur Keith has suggested the term "brevicollis" as a preferable designation. The example at the Institution of this rare condition seems to be unique in respect of the existence of mental deficiency not noted in other cases reported. In conclusion, Dr. Coupland refers to the much discussed subject of sterilisation, and records his view "that it is *real* (eugenic) education that will bring this about, and then a well-instructed public opinion will not need to invoke the law of compulsion."

Prof. A. Kuliabko, of Tomsk University, Siberia, returns thanks to English friends who have sent him books and journals.

The Kind of Nurse She Wants.—In reply to several correspondents, the force of the arguments against two forms of registration was quite clear to us.

Mr. Samson Clark, of East Molesey, chairman of Samson Clark and Co., Ltd., the Advertising Service Agents of Mortimer-street, W., and former Parliamentary candidate for the Chertsey Division of Surrey, asks us to state that he is not in any way connected with someone of the same name, against whom a receiving order in bankruptcy was gazetted last Saturday.

An Address

ON THE

INFLUENCE OF LEAD ON NORMAL AND ABNORMAL CELL-GROWTH

AND ON CERTAIN ORGANS.

Delivered before the North of England Obstetrical and Gynæcological Society on Dec. 21st, 1923.

BY W. BLAIR BELL, M.D., B.S. LOND.,

PRESIDENT OF THE SOCIETY; PROFESSOR OF GYNÆCOLOGY AND OBSTETRICS IN THE UNIVERSITY; GYNÆCOLOGICAL AND OBSTETRICAL SURGEON, ROYAL INFIRMARY, AND HONORARY DIRECTOR, CANCER RESEARCH FUND, LIVERPOOL.

(*With Illustrative Plates.*)

I KEENLY appreciate the sympathetic attitude adopted by the Council in asking me to take as the subject of my Presidential Address the history and progress of our researches concerning the influence of lead on cell growth and the related issues into which we have been drawn. The history of our work is spread over so long a period of time, and the investigations have now covered a field so wide, that I can do no more than give a short summary of what has been done and of what we are endeavouring to do.

EARLY IDEAS AND INVESTIGATIONS.

It is difficult to fix the precise date when I myself first became actively interested in the question of the arrest of cell growth, for no one can be long in practice without giving anxious thought to this problem, the practical outcome of the solution of which may be an indication of a method for the treatment of malignant neoplasms. I must have begun seriously to consider the question between the years 1905 and 1909, for a short while ago among some old papers concerning research work of that period I came across the following memorandum:

"To investigate the cancer problem, by attacking it from the following standpoint.

The ovum is implanted in the uterine wall by a proteolytic action on the part of the trophoblast; but once there, the proliferation of the cells of the chorionic villi effect its further fixation.

Now, normally these chorionic cells reach a certain stage and do not invade the uterus further, but in certain abnormal conditions chorion-epithelioma (cancer) follows; that is to say, there is an unrestrained action on the part of these cells. Why?

Well, in the first place there is no evidence to show that chorion-epithelioma ever occurs before the expulsion or death of the fœtus (as in vesicular mole); consequently, it is a fair supposition that the fœtal circulation controls the abnormal growth of these cells.

Usually, of course, death of the fœtus means death and separation of these cells, but in some cases it means increase in their growth and malignant invasion. This, however, rarely follows full-term pregnancy, so we may infer that with the growth of the fœtus the growing vitality of these cells is gradually decreased.

It is worth investigating, therefore, whether the blood of the full-term fœtus contains any body which will produce death of the chorionic cells and abortion . . ."

The last few sentences of the memorandum, which was written for my own edification and not for publication, have been omitted, as they bear only indirectly upon the present issue. The document is signed and dated Nov. 14th, 1909.

In a few words this note indicates the lines along which I proposed in the first instance to attack the problem. Incidentally, I may say that the nature of chorion epithelioma precluded my viewing the "parasitic theory" of the origin of malignant disease with favour. Adami[1] some years previously, but unknown to me at the time, had adopted a similar argument.

My early experiments consisted of attempts to isolate from the fœtus the substance that is responsible for the inhibition of the chorion epithelium. I failed entirely. Nevertheless, I think success along these lines with more modern methods and more technical skill than I possess may still be possible. Although I recognise how important a part may be played by the elusive influence of cell correlation, I cannot dissociate this from continued control along the lines of cell differentiation. Quite recently it has been shown that highly specialised tissue elements removed from that control and cultivated artificially undergo dedifferentiation—that is, revert to an embryonic type—and that the addition to the culture of normal connective tissue causes the dedifferentiated cells to resume differentiated growth.[2] It will be remembered that in the human subject the chorionic epithelium shows a gradual and natural tendency to disappear as the period of gestation advances; but that in the rabbit the epithelium of this fœtal membrane not only invades the maternal tissues, but also persists throughout pregnancy. The rabbit, therefore, is a suitable animal in all respects for experimental work on the lines indicated.

In the chorion epithelium of several orders of mammals, including Man, we find, then, cells which are essentially malignant; but, insomuch as they are part of the normal mechanism whereby propagation is effected, natural inhibitory or cell-coördinating factors elaborated by the somatic cells of the embryo, restrain further development of, and invasion by, the undifferentiated epithelium. In this phenomenon we are permitted, I hold, to view a demonstration by Nature of the underlying mechanism that not only ensures cell coördination, but also brings recalcitrant embryonic cells into harmony with the rest of the organism. Have we not here presented the obverse of the chain of events that makes possible malignant neoplasia?

Since the fœtal secretion that inhibits the chorion epithelium could not be identified, it seemed to me that it might be worth while to study the action of some readily-available abortifacient. Eventually, I decided to investigate the properties of lead which, as is well known, may cause abortion. I soon came to the conclusion that the generally supposed modes of action—namely, the production of placental hæmorrhage and uterine muscular contractions—are not the primary causes. Hæmorrhage *from* the placental site is common to all cases of abortion, and if the ovum be expelled this must be effected by contractions of the uterine musculature. I see no reason to doubt—and I shall produce histological evidence in support of this view—that during the early stages of gestation lead circulating in the maternal blood acts directly on the embryonic cells of the chorion epithelium. We have found that in the later stages of pregnancy in the rabbit lead can be recovered from the fœtus itself.

I did not confine my attention to the action of lead on the chorion only; I investigated also the toxic effects of the metal on the gonads. The ovary showed no easily recognisable change—at any rate at first—but in the testis we observed the gradual disappearance of spermatozoa (Figs. 1 and 2). Since, then, lead has a selective action on certain tissues—sex cells, blood cells, nerve cells, and embryonic cells—there must be something common to all which attracts the metal. Now, the tissues mentioned are the very structures in which phosphatides—especially lecithin—are found in abundance; and the same chemical fact appears to be true of the embryonic cells of malignant growths.[3] Thus a substantial working hypothesis was evolved.

During the early stages of the work we used in our experiments ionic solutions and preparations which were partly colloidal, and we found a considerable difference in toxicity between the two. Fifty cases of cancer were treated in the period between November, 1920, and November, 1922, with encouraging results in a certain number. A preliminary discussion of this work was published last year.[4]

PRESENT ARRANGEMENTS FOR LABORATORY RESEARCH AND CLINICAL INVESTIGATION.

Although a considerable amount of laboratory and clinical work had been conducted, and scientific confirmation of our ideas and work had been obtained prior to February, 1923, it was then that a great step forward was taken. At the invitation of Vice-Chancellor Adami a few business men met, and most generously undertook to form with certain surgeons a committee to finance and conduct the business side of the work.* A large annual grant, has been placed at our disposal for a limited period. This generosity has enabled us to have twelve free beds set aside for cases of malignant disease. Moreover, the large staff shown in the following list has been enrolled to work out the different problems that have arisen.

Present Staff.

(December, 1923.)

Director: W. Blair Bell (H).

Chemistry.—Physical chemistry: W. C. McC. Lewis (P), J. Corran (W). Biochemistry: R. Coope (P), M. Jowett (W). General: J. Patterson (W).

Pharmacology and Toxicology.—W. J. Dilling (P)

Pathology.—E. E. Glynn (P), R. A. Hendry (P).

Animal Experiments.—H. E. Annett (P).

Clinical Work.—Surgery: H. F. Woolfenden (P), W. R. Williams (W). Anæsthetics: H. L. Patch (P). Special surgery: Throat and Ear, H. V. Forster (H); Eye, T. H. Bickerton (H); Radiography, R. E. Roberts (P); Medicine, John Hay (H).

Secretary: Edward Carey (P).

(H) = Honorary. (W) = Whole-time. (P) = Part-time.

In addition, there are two assistant secretaries and six whole-time laboratory assistants.

Regular meetings of the staff, or of the members concerned in some aspect or allied aspect of the subject, are held. Interim reports are issued from time to time from the different departments, and these are circulated. I need not deal further with the details of organisation; it is sufficient for me to state that the closest correlation and harmony exist, and that remarkable keenness prevails. It seems to us, indeed, that this coöperative system, in which experts in various branches of knowledge concentrate on the ramifications of a single issue, is an executive ideal too rarely realised. It has appealed, I know, to the great lay organisers on our committee.

In what follows it must be clearly recognised that most of the work accomplished has been concerned in clearing the ground, and, although almost entirely confirmatory of the original ideas and investigations, it must not be accepted as final. I shall give the general results now, and, at a later date, the different members of the staff will, it is hoped, publish in appropriate journals full accounts of the investigations with which they have been concerned. It is with the concurrence and assistance of the various members of the staff that I am able to present to-day this précis of our investigations in advance; and in doing so I would ask you to remember that only ten months have elapsed since the present organisation came into being.

GENERAL POISONOUS EFFECTS OF LEAD.

Since we are using lead therapeutically it has been a matter of the first importance that we should not only know the established facts about lead poisoning, but should also investigate certain points which have been doubtful or unknown. That lead is a poison need not be emphasised today; but it must not be supposed that this knowledge is recent. Galen, Aëtius, Palladius, Vitruvius, and Pliny, not to mention the compiler Paul of Ægina, were well acquainted with the ætiology and symptoms of lead poisoning. In 1767 Sir George Baker published an essay in which he traced the cause of "epidemial colic" in Devonshire to the use of lead in the construction of presses and cisterns for the preparation and storage of cyder. A century earlier it had been shown by German writers that the colic associated with the drinking of light wines was due to adulteration with litharge. In 1773 Thomas Houlston, physician to the Liverpool Royal Infirmary, published an essay on the Liverpool spa water, with "An appendix on the accidental use of lead." I am indebted to Mr. T. H. Bickerton for calling my attention to, and for lending me a copy of, this interesting pamphlet. I hope on some occasion in the near future to have the opportunity of dealing with the subject-matter of some of these early expositions.

The most commonly observed symptoms of lead poisoning, and those on which stress is laid in modern text-books of toxicology, are nervous lesions, intestinal colic, nephritis, anæmia, abortion and sterility. Our experience has taught us that the blood changes, with which I shall deal directly, are invariable, but that the avoidance of the more serious phases only is necessary with patients under treatment. Unfortunately, however, in the past we have observed encephalitis, optic atrophy, nephritis, heart block, and intestinal colic. The blue gum-line, not often seen in rabbits, and due, of course, to the formation of lead sulphide by the combination of lead with the sulphur in H_2S from decaying vegetable debris, has been of little practical service in the estimation of the degree of lead poisoning. We have been especially concerned in the study of differences in behaviour of ionic, partly ionic and partly colloidal, and completely colloidal preparations of lead. The physiological and toxic properties of each are being investigated, and the therapeutical dissimilarities noted. That these preparations do differ I shall exemplify presently. Clark[5] has recently drawn attention to, and righly condemned, the extravagant therapeutical claims made for "colloidal" preparations; but I have failed to discover in his writings any suggestion as to the probable mechanism whereby a *true colloidal* preparation may produce an effect.

EXPERIMENTS AND OBSERVATIONS CONCERNING THE TOXIC EFFECTS OF LEAD PREPARATIONS.

Dr. W. J. Dilling has been engaged in pharmacological—and, therefore, in certain physiological and toxicological—experiments concerning the action of lead on the heart, intestine, and uterus. These investigations are in an early or incomplete stage. It is possible that in dissimilar conditions and with solutions of different character and strength, other results may be obtained—results which will necessitate modifications and qualifications in respect of the following findings.

Heart.—1 c.cm. of a solution of lead acetate containing 10 per cent. of lead was injected into the peritoneal cavity of the frog, and continuous records were taken from the ventricle. The effects noted on the tracings were lowering of the tone and slowing of the rhythm due to prolongation of diastole and diminution of contractility. At the expiration of 45 minutes the heart muscle showed evidence of precipitation of albumin (lead albuminate)—a source of difficulty in regard to the interpretation of the action of lead on the tissues. At this stage the general tone was raised, the amplitude of contraction remaining constant for four minutes and then falling from weakening of systole. After 70 minutes a 2–1 heart block commenced. Subsequently there was a gradual slowing of the A.V. rhythm, without marked variation in tone or in amplitude of the ventricle, until the final stage when systole was diminished and cessation occurred in diastole. With slight variations the same phenomena were observed as the result of intraperitoneal injections of a preparation of lead iodide in a state partly colloidal, partly ionic. The interpretation of these results seems to be that the chief action of lead as a cardiac depressant lies in diminution of A.V. conductivity and in reduction of excitability of the rhythmogenic area. Dr. Dilling has made the very important observation that when the mechanism of the heart is deeply

* The members of the committee are: Mr. J. Arthur Smith (chairman), Mr. Rex Cohen (treasurer), Vice-Chancellor Adami, Colonel J. J. Shute, Mr. Crompton Wood, Mr. R. Wilson, Sir Robert Jones, Mr. F. T. Paul, with Mr. E. Carey as secretary.

affected by lead in the way indicated a weak solution of caffeine citrate restores the cardiac action to the normal. A preparation of lead in a completely colloidal state appears to have no action on the heart of the frog.

Intestine.—Experiments were conducted on the isolated intestine of the guineapig and rabbit. A piece of ileum was removed from a newly-killed animal and was suspended in Tyrode's nutrient medium at 38° C., and kept under a continuous stream of oxygen. So far the action of the partly colloidal, partly ionic preparation of lead iodide only has been tested. It was observed that instead of producing contractions lead causes relaxation and inhibition of peristalsis without interference with the vagus mechanism or the muscle. The action may, therefore, be located in the sympathetics or possibly in Auerbach's plexus. It is interesting to note that the actively-contracting intestinal muscle of the rabbit is more resistant to this effect than that of the guineapig.

Uterus.—Experiments were conducted on uterine muscle in the same circumstances and with the same material as in the case of intestinal muscle. It was found that the actively-contracting non-pregnant uterus of the guineapig is immediately inhibited. With a change of Tyrode's medium the contractions recommence. Similar results were obtained with the pregnant uterus. When uterine muscle contractions have been abolished by lead, adrenalin apparently has no effect; but pilocarpine produces characteristic tonic contractions.

Kidney.—Our clinical experience goes to show that after intravenous injections of saturnine preparations, lead may appear fairly early in the urine without any serious consequence following. The cessation of treatment leads to the disappearance of lead. If, however, the treatment be pushed, a fall in the daily quantity of urine excreted is noted, and this is usually associated with œdema of the ankles. A definite decrease in the amount of urine secreted is a grave danger sign; in animals—dogs under treatment for cancer, and experimental rabbits—anuria supervenes with cortical necrosis of the tubules (Fig. 3). It is interesting that with "lead nephritis" the amount of urine secreted may be decreased by one-half and contain an appreciable quantity of lead, without the appearance of albumin. This matter is under investigation. In the chronic form of lead nephritis the kidneys show interstitial fibrosis.

Blood.—The well-known basophil stippling together with hypochromasia and polychromasia of the red cells is of considerable diagnostic importance. The persistence of this phenomenon appears to be related to the natural tolerance of the individual and species of animal concerned: the variations are considerable. Men resist the toxic effects of this metal better than women, and adults than children; rabbits are much more immune than dogs and poultry.

The stippling usually commences at the periphery of the cell, but later may be found throughout; and, so far as we can judge, fine stipples precede the appearance of coarse. The nature of the stippling is unknown; some look upon it as a regenerative process, others as a degenerative. Whether we shall be able to solve the problem I do not know, but we have material enough for an extended study, which I hope may be seriously undertaken shortly. Poikilocytosis and anisocytosis are sometimes seen. The decrease in red cells and the increase in the mononuclear white cells are associated phenomena. Occasionally, nucleated erythrocytes appear at a late stage. Nevertheless, they may occur in young people without other evidence of poisoning. In figure 4 a general picture of the appearance of the blood cells is shown. Anæmia is the outcome of the disappearance of red cells and of the decrease in the hæmoglobin content so often to be observed. Moreover, we have reason to believe that the bone marrow itself may be attacked.

INFLUENCE OF LEAD ON NORMAL GROWTH.

I now come to a very important part of the subject, to which we have been alive from the commencement. I recall an occasion when discussing our work with Mr. F. T. Paul, whose wisdom in these matters is second to that of no one, he said "Can you arrest normal growth with lead? I have always believed that anything that is found to influence the growth of cancer will also influence normal cell-growth." I told him that I was even then conducting experiments on the subject.

Development of Hyacinth Bulbs.—Our first experiments concerned the growth of hyacinths, and these were carefully conducted on a large scale—about 100 bulbs were employed—by Mr. Patterson. The final results may be summarised as follows: The root growth—which, of course, precedes the floral development—was arrested in all cases in which the bulbs were in contact with solutions of normal or basic lead acetate in strengths varying from 1·0 to 0·000001 per cent. of lead (Fig. 5). In the stronger solutions the floral development, also, when it appeared, was stunted; but the weaker solutions (0·00001 and 0·000001 per cent. of lead), although arresting to some degree the root development, did not affect to any appreciable extent the growth of the leaves and flowers (Fig. 6). The white patches which appear in the photographs (Figs. 5 and 6) on the upper parts of the glass vessels containing 1·0 per cent. of lead acetate are due to deposits on the glass. Roots are absent except for one or two white root-spikes about one-eighth of an inch in length. Chemical examination by Mr. Patterson of bulbs some months after the flowers and leaves had withered revealed the presence of lead in them. It appears, then, that the root growth and, to a lesser extent, the floral development of hyacinths are arrested by solutions of lead acetate, and that the degree of arrest varies directly with the strength of the solution used. In this connexion a remarkably interesting observation has been made since this Address was delivered—namely, the bulbs, which were carefully dried and preserved after the flowers and leaves had withered last year (1923), when grown this year in unadulterated tap water present, so far as the root growth is concerned, exactly the same appearance as when grown in lead-adulterated water last year. We expect, therefore, again to observe stunting of the floral development when it appears from those bulbs which were immersed in solutions containing 1·0 per cent. of lead acetate last year.

Experiments conducted by Dr. Dilling in several directions have confirmed these findings.

Germination of Seeds.—The effect on germination of placing the seeds of mustard and cress on jute-covered corks floating on solutions of lead salts was tested. It was observed that solutions of lead acetate containing 0·1 per cent. of lead reduce the germination-rate by 20 per cent., but that the seeds which germinate subsequently grow well (Fig. 7). In the case of sunflower seeds it was, however, observed by Dr. Dilling that not only the rate of germination but also the subsequent growth of the plants was adversely affected. A solution containing 0·25 per cent. of lead reduces the germination rate 34 per cent. below that of the control, while the subsequent growth of the plant is slow and stunted. Solutions containing 0·5 per cent. of lead completely inhibit germination and growth.

Germination of Frogs' Eggs.—Next, investigations were conducted in regard to the effect of lead on the germination of frogs' eggs. Three females and one male were isolated in each of six single porcelain tanks. One lot was kept as a control. The water in the other five tanks was contaminated with lead in the proportions of 1–1000, 1–10,000, 1–20,000, 1–33,000 and 1–100,000 of lead acetate. In all cases copulation soon took place and eggs were deposited; the adult frogs were not obviously affected even after immersion for a period of three months. The eggs in the control tank germinated, but in none of the other tanks was

any change to be observed in the spawn. Further series of observations were made in regard to frogs' spawn laid in normal conditions. No germination occurred in the eggs when the spawn was placed in solutions of lead acetate similar in strength to those already mentioned. It appears, therefore, that solutions so weak as 1–100,000, if not weaker, will prevent the germination of frogs' eggs. Moreover, there was no evidence of the precipitation of lead albuminate in solutions in which the quantity of lead acetate was less than 1–20,000.

Growth of Tadpoles.—These experiments were continued by Dr. Dilling in regard to the growth of healthy tadpoles. Very young tadpoles with external gills were placed in fresh water containing lead acetate in the proportions of 1–1000, 1–5000, 1–10,000, 1–20,000, and 1–100,000. In all cases death resulted within 24 hours. A further series of experiments with more mature tadpoles with internal gills showed that *resistance to the poisonous effects of lead is directly related to the age of the tadpole* and that extremely weak solutions of lead acetate—that is, less than 1–100,000 which is the limit of safety—retard growth.* This action—namely, the arrest of growth—is well demonstrated by the use of partly colloidal solutions of lead. In figure 8 is shown the retardation of growth in the treated tadpole, in comparison with the control, by a partly colloidal preparation of lead iodide containing 0·2 per cent. of lead. I shall discuss the significance of these experiments on the inhibition of animal and vegetable germination and growth later. At the moment I would merely rivet attention on the fact that *the arrest of growth in animal and vegetable organisms is directly proportional to the capacity for, or power of, growth.* This, of course, implies a certain specificity of action. There is obviously a difference between the *killing* of tissues with the cessation of growth, and the *arrest* of growth in living organisms. Moreover, tissues appear to be permanently affected in respect of growth; for, although there be no evidence of continued lead poisoning, a child once poisoned remains stunted. Injured organs in the adult—unconnected with growth—show a definite tendency to complete recovery once the lead has been removed from the tissues in question.

There are, of course, many things that may influence germination and growth; heat and cold, electrical discharges, rays of various kinds, and chemical substances of different characters, such as acids and alkalis. Nevertheless, it must be borne in mind that a similar *effect* on growth does not necessarily signify a similarity of *action*, nor does similarity of action in this respect necessarily imply similarity of effect in the other conditions in which lead appears to have a specific action.

INFLUENCE OF LEAD ON THE CELLS CONCERNED IN THE IMPLANTATION OF THE OVUM.

I propose to discuss separately this important action of lead—a consideration of the possibility of which engaged my attention from the first, as I have already stated—for although, strictly speaking, the effect may be held to concern the arrest of the normal growth of embryonic cells, yet in this case we have to deal in part with the inhibition of undifferentiated cells rather than what may be called normal independent somatic development and growth of the living unit which I have just considered.

I shall, therefore, now deal with the abortifacient action of lead in those mammals in which actual invasion of the maternal tissues by the trophoblast of the ovum is seen. I have not been able to make comparative investigations with the ungulates, in which order of mammals there is apposition only of the chorion to the cotyledonary surfaces, because of laboratory limitations in regard to animals of so large a size. Yet, the action of lead on the ovum in the uterus of an ungulate would be interesting and informative, for we have always to decide whether abortion follows death of the embryo poisoned with lead, whether it be due to the action of lead on the chorionic epithelium, or whether both factors are concerned.

Although the abortifacient action of lead has long been known, careful studies of the site from which abortion has occurred are singularly few; indeed I know of no complete series of observations other than our own. Legge and Goadby [6] assert that "From what is stated later with regard to the curious action of lead upon the blood, the mechanism of abortion is easily understood; it is probable that placental hæmorrhages are produced as in other organs of the body." Oliver [7] states that "lead causes abortion probably by acting upon the unstriped muscular fibre of the womb and inducing spasm. The poison also passes from the blood of the mother through the placenta to the fœtus in utero, and by killing the fœtus it thus indirectly brings about abortion."

I have already exposed the obvious pitfall in regard to hæmorrhage *from* the placental site. I may also state that in our animals in which abortion occurred as the result of two or three intravenous injections of colloidal lead there was no hæmorrhage *in* the placental site or elsewhere, no stippling of the blood or any other evidence of lead poisoning. With regard to Sir Thomas Oliver's statement, Dr. Dilling has shown that preparations partly ionic, partly colloidal and containing 0·2 per cent. of lead, cause inhibition

* Owing to an oversight on my part the strengths of the ionic solutions used in the experiments concerning the germination of frogs' eggs and the growth of tadpoles were estimated in terms of lead acetate instead of lead, which constitutes 53·2 per cent. of lead acetate.

Descriptions of Illustrations on Special Plates.

FIG. 1.—Photomicrograph of a section of the testis of the normal rabbit. (× 250.)

FIG. 2.—Photomicrograph of a section of the testis of the rabbit after treatment with lead, showing the complete absence of spermatozoa and almost complete absence of spermatogonia. (× 250.)

FIG. 3.—Photomicrograph of section of the kidney of a dog poisoned by lead. There is necrosis of the cortical tubules. (× 62.)

FIG. 4.—Composite drawing to illustrate the changes that may be seen in the blood of a mammal poisoned by lead. Basophil stippling and nucleation of the erythrocytes is readily to be observed. There is also anisocytosis and poikilocytosis. (× 600.)

*FIG. 5.—Development of hyacinth bulbs, showing arrest of root growth resulting from contact with solutions of normal or basic lead acetate of various strengths.

*FIG. 6.—Development of hyacinth bulbs in contact with lead acetate solutions of various strengths. The root growth show graduated stunting, and in the strongest solution (1·0 per cent.) the floral development is also greatly arrested.

FIG. 9.—Section of the uterus of a rabbit, showing normal placental attachments on the tenth day after fertilisation. The dark area on the surface of the placental cotyledon marks the region of invasion by chorionic epithelium. (×3·3.)

FIG. 10.—Portion of the area of invasion of chorionic epithelium on the surface of the placental cotyledon under a higher magnification. (× 20.)

FIG. 11.—Section of the uterus of a rabbit which received three injections of colloidal lead (S_3) at intervals of two days from the eighth day after fertilisation. The placenta is clearly seen; and the white-ringed portion is shown under higher magnification in figure 12. (× 3·3.)

FIG. 12.—Portion of uterus and contents shown enclosed in white ring in figure 11. (× 25.) D, Indicates the wall of the uterus apart from the placental site. Large decidual cells are to be seen in the upper portion. M, Maternal mucosa. P, Placenta which is degenerated. No chorionic epithelial cells are to be seen.

FIG. 13.—Section of the uterus of a rabbit which aborted between the eighth and sixteenth day after fertilisation, stained by Weigert's method. Fibrin is shown *within* the vessels only; there is none in the surrounding tissues, as would have been the case if hæmorrhage had occurred. (× 8.)

FIG. 14.—Section of the uterus with placental site of a rabbit 11 days after coitus. Two doses of colloidal lead had been given at intervals of three days from the third day. No fœtal remnant appears in the section. (× 8.)

FIG. 15.—Section of the uterus of a rabbit on thirteenth day after fertilisation, the animal having received three doses of colloidal lead at intervals of three days, commencing on third day after coitus. The placental site has almost recovered from the chorionic invasion. (× 8.)

* The deposit of lead carbonate on the glass vessels containing the strongest solution (1·0 per cent.) unfortunately prevents proper observation of the absence of root growth. (See text.)

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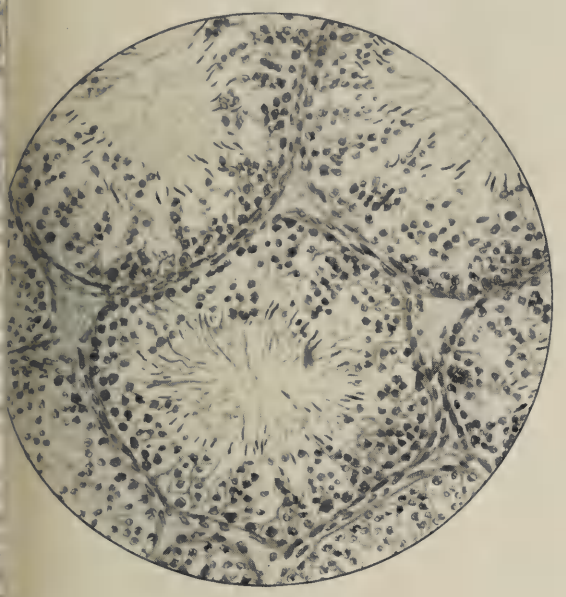

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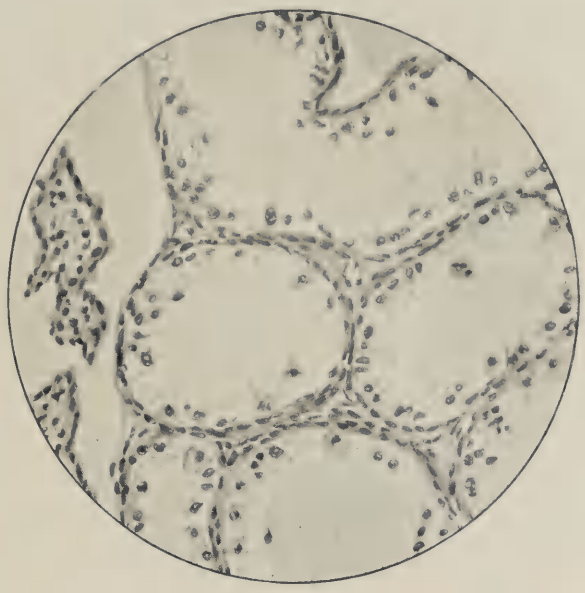

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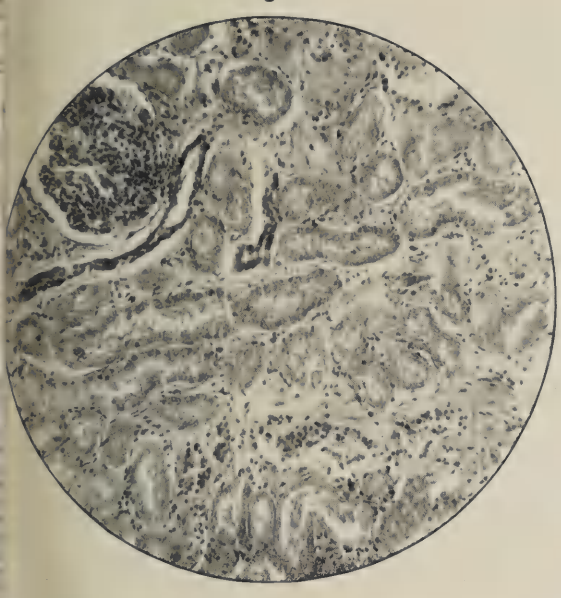

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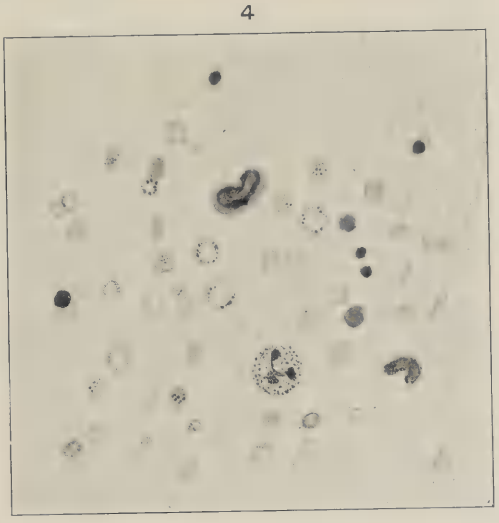

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PROF. BLAIR BELL: THE INFLUENCE OF LEAD ON CELL-GROWTH, ETC.

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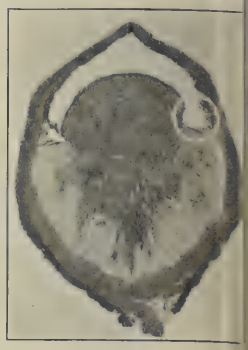

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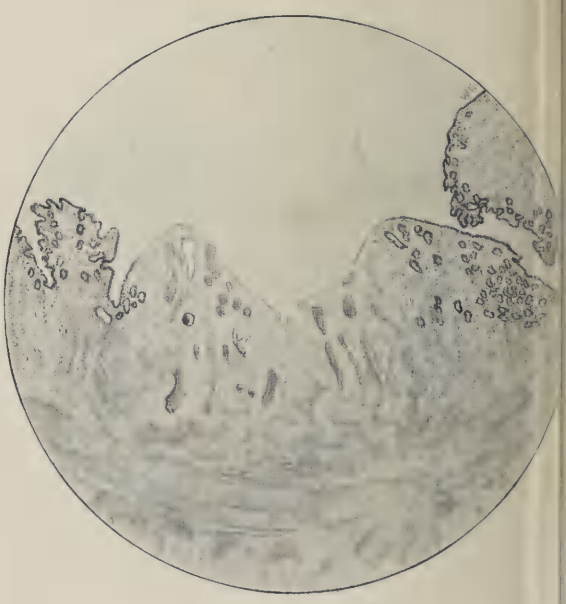

of stimulation, of uterine contractions. The possibility of abortion following death of the fœtus from lead poisoning cannot be contested: but in our opinion lead can only kill the fœtus secondarily, having first attacked the chorionic epithelium.

So long ago as 1911 I made a collection of sections from the pregnant uteri of rabbits on different dates of gestation in order that I might compare the normal histological anatomy with the abnormal condition produced by lead. To understand the normal histological phenomena associated with pregnancy in the rabbit and correctly to appreciate and appraise the various alterations in the maternal mucosa and the developments in the fœtal membranes and their epithelial coverings, is not an easy task; and it would have been considerably more difficult had we not had the advantage of being able to study the previous work of Duval,[8] Chipman,[9] and others. This is not the place to recapitulate our difficulties and observations of the normal processes of gestation in the rabbit. It is sufficient for me to say that the fœtal epithelium in the early stages of pregnancy is sometimes better appreciated in its absence after abortion than by its presence in the maternal tissues. Dr. Annett has conducted the animal injection experiments that have yielded for investigation by Dr. Hendry the material so important to our research.

It is interesting to note that in our early investigations when we used solutions of lead in ionic state the animals that aborted were always deeply poisoned. Other observers, also, have found that pregnant rabbits, which were made to consume lead with their food, invariably died after abortion from lead poisoning.[10] I have made a similar observation in connexion with the purposeful production of abortion in the human subject by the selfadministration of lead. In our more recent experiments, however,

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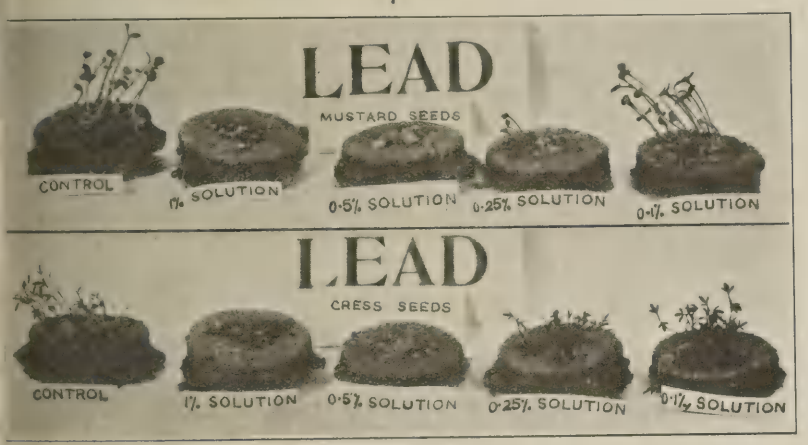

FIG. 7.—Effects produced on the germination of mustard and cress seeds and on the subsequent development of the plant when grown on jute-covered corks floating on lead acetate solutions of various strengths.

Dr. Annett has found, as already stated, that by using lead in a true colloidal state abortion alone may be specifically produced. Animals in which abortion has been produced are sterile subsequently for a limited time only. In figures 9 and 10 are shown uteri with normal placental attachments in the rabbit on the tenth day after fertilisation. The darkly staining epithelium of the chorion is clearly seen invading superficially the cotyledon in connexion with which the placenta is formed. Figure 11 is an illustration of the uterus of a rabbit, which received three injections of colloidal lead at intervals of two days, from the eighth day after coitus. The animal was killed on what should have been the sixteenth day of gestation. The placenta is clearly seen, but histological examination (Fig. 12) reveals the fact that the chorionic epithelium has disappeared and that what remains is a degenerating mass of tissue. The maternal vessels are thrombosed (Fig. 13), and there is no evidence of "hæmorrhage." In figure 14 the uterus and placental site of a rabbit 11 days after coitus are shown. Two doses of colloidal lead had been given at intervals of three days from the third day. No fœtal remnant is to be seen in the section.

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FIG. 8.—Retardation of growth in the tadpole (left) when treated with a partly colloidal preparation of lead iodide containing 0·2 per cent. of lead. The tadpole on the right is the normal control.

The uterus on the thirteenth day after fertilisation, illustrated in figure 15, is from a rabbit which received three doses of colloidal lead at intervals of three days commencing on the third day after coitus. In this case the placental site has almost recovered from the chorionic invasion; indeed, were there not other evidence of pregnancy, such as the decidual reaction on the opposite wall of the uterus, it would, perhaps, be a little difficult to establish the existence of recent pregnancy. As I have already stated, the animals gave no hæmatological or other evidence of lead poisoning. We are endeavouring to obtain material at various short intervals after single doses of colloidal lead. In all our present specimens the chorionic epithelium had been completely destroyed. We want now to study the actual process of destruction.

Although many toxins produce abortion by affecting the fœtus itself, I am unaware of any chemical substance that has an abortifacient action similar to that of lead. Experiments are, however, now being conducted in order that such metals as thorium, copper, and zinc may be tested. At present we have no evidence, clinical or otherwise, which suggests that abortion may be caused by poisoning with metallic compounds other than lead. On the other hand, we have ample clinical evidence that mercury and calcium salts do not do so.

DISCUSSION OF EXPERIMENTS CONCERNING GROWTH.

I am now in a position briefly to discuss and correlate the essential points which have been elucidated by the foregoing experiments in relation to germination and growth.

Germination is the earliest demonstration of growth; therefore the inhibition by lead of this phenomenon, whether it be in regard to eggs or seeds, is a matter of considerable importance. Although the actual chemical mechanism of the phosphatide-growth relationship has not been demonstrated, it is certain that such a relationship exists, and that eggs, seeds, and young growing tissues are rich in similar phosphatides, even though in varying degrees. Maclean[11]

states that "Although no reliable method for the estimation of plant phosphatides has as yet been evolved, the results recorded by different observers indicate that the leguminosæ are relatively rich in this substance, the dried seeds containing up to 1·5 per cent. or more of phosphatides. On the other hand, cereals generally contain much less, the amount present being roughly about 0·5 per cent."

It is common knowledge that the yolk of eggs contains a very large quantity of the various associated phosphatides, and it is highly probable that the ovum itself is rich in these substances, although so far I have only been able to discover general statements on the subject. When, next, we turn our attention to the phosphatide content of young growing plants and animals we find that many investigations have been made; and this is especially the case in regard to vertebrates, in which we are, of course, chiefly interested. Glikin [12] has paid special attention to the subject, and has shown that a high percentage of lecithin is found in the bone marrow of the young of those species in which the offspring is feeble and helpless at birth. The same observer [13] has also found that the tissues of young animals are particularly rich in lipins, and that the phosphatide content decreases with age.

Now I have maintained the general hypothesis that in the adult lead exercises a toxic influence almost entirely on those special tissues that contain phosphatides in abundance. I have purposely excluded the kidneys and liver from consideration in this connexion, for, although rich in phosphatides, they are specially concerned in the elimination of lead from the organism, and therefore have a double selective action, as it were, on the metal; but of this there is no necessity to take advantage for the purpose of my argument.

It is, then, extremely interesting to know that lead is not only much more toxic to the young and pre-adolescent than to the adult and old throughout the vertebrate kingdom, but also that the *effects produced by the metal are general in the young and local in the adult*. When discussing the question of the affinity of lead for certain phosphatides with my colleagues and others, I have occasionally been asked why it is that lead, if it unites with phosphatides, does not attack equally every cell in the body; for it is generally stated that in all cells phospholipins are present.

The answer is contained in the aphorism I have just given concerning the different effects in the young and in the fully grown—that is to say, in the tadpole, as in the human infant, every cell in the body *is* affected; and, as the result, there is a condition of *somatic stunting*. It may be suggested that such an effect could be produced by the action of lead on the phosphatides of the anterior lobe of the pituitary, but while I cannot at the moment refute such an argument with positive evidence to the contrary, I may point out that this explanation cannot apply to plants. Moreover, whereas the growth of the tadpole is arrested and the animal poisoned by lead acetate in a solution no stronger than 1–100,000—we have not yet determined the minimal effective strength in regard to growth, but this is probably in the neighbourhood of 1–1,000,000—the adult frog is apparently unaffected by a solution containing lead acetate in the proportion of 1–1000. The tolerance of mammals, including Man, to lead likewise varies with the age of the creature concerned. What is the explanation? Why is it that in the young the effect is general and in the adult local?

Surely the reason is clear. In the young all the cells in the body are actively concerned in the processes of growth, and it is highly probable, therefore, that the phosphatides are in some more available form than is the case in the adult—if, indeed, the somatic tissues in general in middle and old age contain phosphatides in abundance. It seems reasonable to suppose, and this supposition is borne out by the related action of lead, that once somatic growth has ceased phospholipins only exist in an available form—physiologically and toxicologically, that is, chemically considered—in those tissues, the nervous, reproductive and the rest, of which I have spoken.

I need say but little more of the chorion epithelium—the most embryonic of all normal tissues of the developing ovum, the tissue of all others that grows with singular activity and invasive power, and which may become "malignant" in its neoplastic proclivities—for surely it is not difficult, in view of the experimental evidence I have already discussed, to understand the rapidity and certainty with which lead attacks the cells in question, nor to appreciate the fact that the effect produced is swifter and more certain in the early days of gestation than in the later phases, when the epithelium has lost its plastic, invasive, and destructive properties.

Abnormal Cell-growth.

It is often stated that there is no essential difference between innocent and malignant neoplasia, and in support of this belief it has been urged that it is sometimes difficult to distinguish histologically one from the other, that some growths are locally malignant—for example, ovarian papillomata—and that an innocent neoplasm may become malignant. There are, indeed, those who assert that the clinical history and outcome alone enable the surgeon to settle the question in certain cases, for instance, between a cellular fibromyoma of the uterus and spindle-celled sarcoma, and whether some papillomata be innocent or malignant. Even if we disregard such arguments as these because they refer to the subsequent course of events rather than to initial phenomena, it must be admitted that the primary metabolic factors associated with neoplasia are the same in both types—indeed, in all types of growth—and that the numerous inciting factors in abnormal growth—infection, trauma, and the like—are identical. It is only when we come to the question of somatic as opposed to chorion-like development that the real difference is observable; in the case of an innocent neoplasm hyperplasia occurs, in a malignant dedifferentiated growth supervenes.

I wish to lay some stress on the similarity of the intrinsic metabolic factors concerned in all forms of growth—whether there be somatic differentiation or dedifferentiation—for on this fact the explanation of all our work on cell growth depends. As I have already mentioned, it has been shown by Bullock and Cramer that, in common with all other actively-growing cells, the phosphatide content of malignant tumours varies directly with the rate of growth: the more rapid the growth of the tumour the greater the quantity of phosphatides present.

Effect of Lead on Abnormal Cell-growth.

If it could be shown that the action of lead is also proportional in its degree of toxicity to the rate and power of growth of malignant tumours, as it is in the case of normal growth, then a complete case would have been made out for the treatment of every malignant growth with preparations of this metal. Unfortunately, the proof is not so readily obtainable as we would wish. Nevertheless, Mr. Patterson has found that in dogs which suffered with cancer and died from lead poisoning, this metal is concentrated in by far the largest proportion in the neoplasm and the testes. He has also found lead in disproportionate quantities in tumours from patients treated with this metal before operation. Why, then, it will be asked, is there any difficulty in treatment? Let me explain.

In our experiments, it will be observed, the growing tissues concerned could not escape from the influence of the metal. It is not possible, however, in cases of malignant disease to make sure that sufficient lead reaches the actively-growing cells; this is, of course, more evident in regard to carcinomata than sarcomata which possess a good blood supply. Moreover, to damage only the cells of the neoplasm and to leave uninjured those of other parts of the organism which may have an attraction for lead is a formidable

proposition. These two difficulties are, without doubt, difficulties of the first order. So far they have not entirely yielded to our attack, although I think the early recognition of them, before the treatment of patients commenced, has led to results that we could not have obtained had we simply administered lead. For the most part patients with malignant disease are adults; consequently there is no "loss" of lead to the normal growing tissues. We are concerned, therefore, in endeavouring to reach the neoplasm without injuring the vital organs which also attract lead.

Now, we have proved that not only in dogs with cancer, but also in the case of the adult human subject suffering with this disease, lead is recoverable from the growth in a quantity out of proportion to that contained in any other part of the body, excepting only the gonads; consequently we may say that lead is attracted to the growth in preference to other tissues, and probably this is so for the reasons I have given. Yet, it still remains true that we cannot be satisfied with the fact that the new growth is capable of holding a large proportion of the lead stored in the body; its powers of attraction unaided may not be great enough for the neoplasm to take from the blood stream sufficient lead entirely to arrest further development. From the first this difficulty presented itself, and seeking to overcome it we endeavoured to find something for which growing tissues have a special preference, possibly not possessed to the same extent, if at all, by the vital organs that show an affinity for lead. The only substance that readily came to mind was thyroiodin, so we have used this in combination with lead in the hope of getting the metal taken up, as it were, by false pretences.

Moreover, we have long considered, and are now trying, a method whereby we hope to "lock" the metal in the neoplastic tissues by means of calcium salts administered intravenously in a colloidal form after the patient has received as much lead as he or she can tolerate. Calcium salts reduce, as is well known, the permeability of the cell membrane. I am glad to say that Prof. Lewis and his collaborators have succeeded in making a very stable calcium colloid that stands boiling and is innocuous to the organism when introduced into the blood stream.

PATHOLOGICAL INVESTIGATIONS.

We have never hoped to obtain on *ordinary* histological examination evidence of a specific change in carcinomata due to treatment with lead. The fact that cancer is a more or less chronic disease and one in which the lesions undergo necrotic and fibrotic changes in the natural course of events, precludes the inclusion of such changes as specific to lead, although we know that similar changes may be produced by this metal in the liver and kidneys. In only one case, in which a rapid cure was effected, was there evidence of unusual appearances. We have not had an opportunity of examining sarcomata before and after treatment except in one case which did not recover.

My colleague, Prof. Glynn, aptly summarises the position in the following statement:—

"All these considerations suggest that *easily recognisable* histological changes in cancerous tissue, produced by lead treatment, will be *slight and non-specific* and will probably resemble those often found in untreated cancer. One would also expect that regressive changes would be more marked at the periphery of the cancer where the vessels and lymphatics are presumably normal.

The examination of all the available sections confirms these suppositions. . . . No marked regressive changes have been noted and certainly no specific changes.

Nevertheless, there is on the whole more retrogression in the treated than in the untreated. This is particularly recognisable by the diminution in the number of epithelial cells and an increase in the amount of stroma. These changes are often associated with distortion, atrophy, œdema, or mucoid change of certain groups of epithelial cells."

I hope when fat stains have been used that we may be able to note some specific change in regard to the lipin content of the cancer cell before and after treatment.

CHEMICAL INVESTIGATIONS AND CONSIDERATIONS.

Lead and the Phosphatides.—It will be wondered whether we have any chemical evidence to support certain explanations I have given, particularly in regard to the way in which lead inhibits growth. Whether this metal has an affinity for phosphatides that can be demonstrated on the bench of a laboratory. As I have already implied, the selective action of any toxic substance must depend on chemical affinity between the toxic body and some element or elements in the tissues affected. I use the term "chemical affinity" in the widest sense to include manifestations ascribed to the processes associated with physical chemistry. There is, however, a tendency today to look upon all phenomena, even adsorption, with a stoichiometrical eye.

In quite the early stages of the investigation we had found that an emulsion of *commercial* lecithin is immediately precipitated by ionic solutions of lead acetate; and that zinc and copper acetates have relatively less effect in this respect. With regard to the phosphatides it must be remembered that they, or at any rate those of which we have any substantial knowledge, are all associated in the tissues, and that it is only with considerable difficulty that they can be separated and obtained chemically pure. The different solubilities in alcohol of lecithin, kephalin, and sphingomyelin are of assistance in differentiating one from another. Prof. Lewis has found that both commercial and pure lecithin in water have negative charges as demonstrated by the cataphoresis method. This, of course, is of importance in regard to the question of combination with cations, such as lead. Experiments were also conducted with various metallic salts in relation to pure and commercial lecithin, and pure kephalin and sphingomyelin. It was found that whereas divalent cations precipitate both kephalin and sphingomyelin, lecithin, when pure, is not precipitated either by lead ion or lead suspensoid, or, indeed, by any divalent cation. Since there is total precipitation by lead ion of the commercial lecithin emulsion, which contains all three phosphatides, it would seem that lecithin is carried down by the lead kephalin and lead sphingomyelin precipitates. Cholesterol appears to favour this reaction, presumably by increasing the degree of dispersion of the commercial lecithin emulsion.

The fact that pure lecithin is not precipitated by lead does not by any means prove that there is absence of chemical combination between them. In one of the interim reports by Prof. Lewis and Dr. Corran is the following discussion of their investigations into this question:—

"From the above experiments on precipitations of commercial lecithin emulsions by lead suspensions, it would appear that absence of precipitation does not necessarily denote absence of chemical combination. In fact, experience tends to point to the conclusion that precipitation in such cases is purely an adsorption phenomenon. For example, on the addition of a calcium salt to commercial lecithin, a ppt. is obtained. On attempting to wash this ppt. it apparently re-emulsifies. This suggests that the precipitation is caused by the adsorption of calcium ions, and when the latter are removed by washing the lecithin reverts to the emulsion form. Work is at present being carried out to decide whether this ppt. with calcium is a chemical or an adsorption compound.

In the case of lead ion, which apparently forms a definite compound with at least one of the constituents of commercial lecithin, precipitation would not occur, according to the above considerations, until there was excess lead ion above that required to form the chemical compound. The observation has been made that, on attempting to wash the ppt. formed by the addition of lead acetate to commercial lecithin emulsions, there is a great tendency to re-emulsify. Thus, in the case of Levene's pure lecithin, although neither lead ion nor lead suspensions caused precipitation, it was quite possible that the resulting emulsion consisted of a combination of lead and lecithin. Unfortunately, the resulting emulsion in this case was not tested to see if the lead was in combination with the lecithin, since it was to decide whether or not lead ion actually precipitated pure lecithin that the experiment was primarily performed."

It is unfortunate that the difficulty of separating lecithin from kephalin and sphingomyelin is considerable, and that we have been able to procure—and this we owe to the kindness of Dr. Levene, of the Rockefeller Institute—only a small quantity of pure lecithin. Nevertheless, since lecithin is so closely associated with the other phosphatides in the tissues, and resembles, in fact, commercial lecithin in this respect rather than pure lecithin, it is hardly possible that it would remain unaffected if the other phospholipins were combined with lead. The interesting observation has been made in the Physical Chemistry Department that the percentage of lead in the lead-lecithin (commercial) compound is between 11 and 12 per cent.

Although I have suggested that the rôle played by lead in the phenomenon of arrested growth depends on a direct chemical reaction between lead ion and phosphatides, we must not overlook the possibility that lead may act in other ways; for example, by the inhibition of enzyme action in relation to growth. The distinction between these effects, however, may not be so great as appears at first sight, since such a function of lecithin as, for instance, that of an oxygen carrier, might indirectly affect enzyme action.

Experiments Concerning Hydrogen-ion Concentration.—The hydrogen-ion concentration has often been taken into account in explanations of the effects of solutions on either side of neutrality, which are believed to exercise a beneficial or detrimental influence on normal growth. Prof. Lewis and his colleagues have devoted much time to the study of the hydrogen-ion concentrations in the various preparations that have been used experimentally and therapeutically for the arrest of normal and abnormal cell-growth. This has been considered a matter of some importance, not only in connexion with the views that have been expressed concerning the influence of acid and alkaline solutions on, for instance, sea urchin's eggs,[14] but also in regard to the effect that might be produced by tissues—normal and abnormal—on the preparations injected into the blood stream. In the first place, it was found that the pH of lead suspensions could not be accurately measured by means of the usual hydrogen electrode, owing to the fact that there is a chemical reaction between the hydrogen and the lead suspension, and this causes the hydrogen electrode to register an oxidation potential. The Biilmann quinhydrone electrode [15] was therefore tested with solutions of known pH and found accurate. It was again observed, however, that the results with lead suspensions were neither uniform nor correct. It was accordingly decided to try a gold terminal instead of one made of platinum, for it was thought that the platinum was acting as a catalyst. We had no knowledge at that time that gold had been used quite recently for a somewhat similar purpose in Gowland Hopkins' laboratory. With the adoption of a gold terminal satisfactory results were obtained with the Biilmann quinhydrone electrode. I do not think it necessary at this stage to say more than that the suspensions of lead prepared by Prof. Lewis have a pH of 10·9 when the lead content is 0·25 per cent., and a pH of 10·3 when 0·1 per cent.—both distinctly on the alkaline side. An examination of a partly ionic, partly colloidal, preparation of lead iodide made by Mr. Patterson revealed a pH of 5·5, which is on the acid side of neutrality. It now remains for the pH of malignant tumours in situ to be estimated and compared with that of the normal tissues of the same patient.

Functions of Cholesterol and Lecithin in Cell membranes.—Another matter of great biochemical interest has been investigated by the same workers: namely, the function of cholesterol in cell membranes, and the effect of lecithin on oil-water interfacial tension. According to physicochemical theory any substance which is soluble in oil and at the same time lowers the interfacial tension between oil and water will favour the formation of a water-dispersed-in-oil type of emulsion. It was found that cholesterol and calcium chloride have a similar action in that they decrease the interfacial tension between oil—olive and cotton-seed oil were used—and water. Calcium soap has long been known to be more "soluble" on the oil side of the interface, and cholesterol is soluble throughout the bulk of the oil to which reference has been made; consequently cholesterol and calcium favour the formation of the water-dispersed-in-oil type of emulsion, of which butter is an example. As cotton-seed oil and olive oil were employed in the experiments it is not possible to do more than surmise that the cell membrane, which is believed normally to consist of a water-dispersed-in-oil system is similarly affected. Lecithin appears to have an influence exactly opposite to that of cholesterol: that is to say lecithin favours an oil-dispersed-in-water emulsion an example of such a system being cream.

The practical suggestion arising from this work is that in carcinoma, in which the proportion of lecithin to cholesterol has been found to be higher than in normal tissues,[16] the cell membrane will be less stable owing to the fact that it probably exists as an oil-dispersed-in-water, in contrast with the normal water-dispersed-in-oil, type of emulsion, with increased permeability of the cell covering.

Action of Lead on Enzymes.—Dr. Coope and Dr. Jowett have commenced a series of investigations concerning the effect of lead on enzyme action, and these workers have issued an interim report. The results, however, have proved difficult of correlation and interpretation. Nevertheless, it appears that lead has a definite retarding effect on tryptic digestion. It is, however, quite impossible to say at present whether lead influences the enzymes that may be concerned in cell growth. The work is to be prosecuted on new and more extended lines.

Preparation of Lead Suspensions.—The great advantage of utilising lead suspended in a colloidal form is obvious. It is lead ion that produces the poisonous and probably the therapeutical effects: but owing to the highly toxic action of large amounts of lead ion it is not advisable to use it therapeutically by intravenous injection; at least, if we do, we are using a preparation that is uncontrollable and highly dangerous. A large amount of work has, therefore, been conducted in an attempt to secure a reliable and *stable* preparation of lead suspension. In regard to complete stability—stability of more than a few days' duration—we have failed. First, we employed lead iodide suspended in gelatin. It occurred to us to use thyroiodin as our source of iodine, and to employ a calcium salt to increase the stability of the suspension by decreasing, as I thought, the power of what is generally called "imbibition" on the part of the gelatin coverings of the suspended particles. This suspension was prepared by Mr. Patterson. Prof. Lewis, however, attributes the action of calcium in this respect to electrical protection of the ordinary kind resulting from adsorption of the divalent calcium ions on the colloid. Whether the calcium likewise affects the adjacent layer of gelatin in the sense of "hardening" he thinks uncertain. Subsequently, it was proved that the lead iodide preparation is only partly colloidal, and that it always contains, as we had suspected, lead ion in considerable quantity.

Next, much work was done in the Muspratt Laboratories in regard to lead suspensions made by the electrical method of Bredig. By the use of calcium increased stability was secured and in a summarising interim report Prof. Lewis and his colleagues state:—

"We conclude, therefore, that calcium ion is an indispensable adjunct for the preparation of stable suspensions of lead. It was also observed that the addition of isoelectric gelatin further increases the efficiency of the protective action of calcium ion on lead suspension."

Weak acids immediately convert this colloidal suspension of lead into lead ion. Yet, although the suspension can be boiled and will remain stable for perhaps three days, so far we have failed to produce a preparation which can be generally utilised.

Another initial difficulty which has been easily surmounted was the large size of many of the particles of lead in the electrically-prepared suspension. These, however, can be thrown out by centrifugalisation, those remaining being no larger than 0·3 μ in diameter.

I have spoken of lead ion as being active, and of truly colloidal lead as inert; but it is certain that suspensions are disturbed, and lead ion slowly produced in the blood stream, and rapidly in any part of the body in which the hydrogen-ion concentration is high, such as would obtain in a tumour undergoing autolysis. As I have said, we have not yet, but hope soon to have, information concerning the hydrogen-ion concentration in actively growing neoplasms in which there is no degeneration.

The very numerous and arduous experiments conducted in the Muspratt laboratories, which will, I hope, be published eventually, may throw light on much beyond that with which we are immediately concerned.

In concluding this summary of the chemical investigations, I may say that our chief difficulties now lie, not so much in justifying the original ideas concerning the action of lead on growth, for that has been made evident, even though the complete chemical mechanism may require further elucidation, as in applying them to the treatment of malignant disease. This has always been the case in the treatment of tropical diseases, syphilis, or any other malady that has long resisted curative therapy.

Here we are faced, in the first place, with the problem of introducing lead into the blood stream in an inert state, and, although growing tissues have themselves an attraction for this metal, of getting it in sufficient quantities into the new growth alone. In the second place, even though we get lead into the tumour, can we ensure that it stays there and produces the effect required? I have endeavoured to relate the means we have adopted, and are adopting, to get over these apparently insuperable obstacles to successful treatment.

CLINICAL WORK.

It has been a source of pleasure to me to learn from some of my fellow-members of the Society that they are more interested in the scientific aspect of the subject, which I have just endeavoured to expound, than in the purely clinical, for they wisely realise that at first, at any rate, there are and must be the difficulties of which I have spoken, and that patience, time, and energy alone can overcome them. In acknowledgment of this thoughtful point of view, and because a number of patients, believed to be cured of sarcoma and carcinoma, presented themselves for inspection and examination before the Address, I shall deal very briefly with our clinical work.

Methods of Treatment.

Intravenous Injection.—It is almost certain that the ultimate mode of treatment in malignant disease will be by the blood stream. Wonderful as may be the results of operation, and of applications of X rays and radium, the field of action, so far as these procedures are concerned, is a local one. Moreover, even though the growth be quite local, there are many cases in which it is beyond the reach of such methods of treatment. There are, too, numerous instances in which metastases are present in inaccessible organs. All this is recognised by the thoughtful surgeon. It is, however, well that the limitation of local treatment should be repeatedly emphasised, lest too great a sense of contentment obstruct our view of better things. In three years (Nov. 9th, 1920 to Nov. 9th, 1923) 1531 intravenous injections were given, chiefly by Mr. Woolfenden. At first we used only partly colloidal lead iodide preparations of which many variations have been made; when this preparation is now employed, we inject what is known as A_1 A_2 prepared as soon as possible before injection. As this can be kept in two solutions, it might be generally used were it entirely satisfactory; but it is not, for it is only partly colloidal in nature, and therefore toxic. The electrically prepared colloid made in the Muspratt laboratories appears to be satisfactory in respect of its atoxicity. We believe that lead ion is slowly liberated from the colloidal solution in the blood, and thus a more or less continuous small dosage of lead ion is administered.† The preparation now in use is known as S_3.

Intramuscular Injection.—It is sometimes extraordinarily difficult, in fat women, to give an intravenous injection however skilful the operator may be. We have never been defeated in the end, but it is possible that some day we may be. We have, therefore, given thought to the question of intramuscular injection in such circumstances; and Mr. Patterson has prepared for the purpose a combination—as we believe—of lead and cod-liver oil. Our animal experiments with this material, although they have not been pushed to a final conclusion, indicate that such a preparation is not very readily absorbed. In any case, intramuscular injection will never be a method of choice.

Ionisation.—A third method of administration has been utilised—namely, ionisation. We have found that this method of treatment is only useful when the patient has been poisoned with intravenous injections, and no more are justifiable for the time being. Although we have not observed much change in a superficial growth, pain appears often to be relieved. The type of case in which we have employed ionisation has been that in which there are hard avascular secondary skin nodules or secondary deposits in the sternum. On the other hand, Dr. Annett has treated three rats with large malignant tumours,‡ and in every case the tumour has entirely disappeared. Borrel [17] has obtained somewhat similar results with lead ionisation of rat tumours. In contradistinction, a case of cancer of the scrotum of a dog did not appear clinically to be altered by this method of treatment.

Lead and X Rays.—We have seen several very striking instances in which tumours in patients first treated with lead without the disappearance of the growth subsequently exhibited striking retrogression after applications of X rays. In some cases X ray treatment had had no effect previously to treatment with lead. The beneficial effect, or perhaps I should say augmented effect, of X rays in these cases is probably due to secondary radiations produced by the lead in the tumours. Dr. Roberts has in hand some experimental work on this subject.

Immediate and Remote Effects of Injections.

These effects are local and general. Formerly there was considerable general disturbance after an intravenous injection, vomiting, rigors, and rise of temperature being usual concomitants. Now, however, if the improved material be warm and the injection of it be slow, a general reaction is rare. In carcinoma, œdema around the lesion is frequently observed after a few injections. Sometimes with sarcomata a considerable local reaction is produced after about the third dose. If the tumour be near the surface, the skin over it becomes tense and red, and a slight general febrile reaction may supervene. In a large majority of all cases, whatever the nature of the neoplasm may be, the patients complain of *pain in the growth between two to eight hours after injection.* Our attention has repeatedly been called by the nurses in charge to this suggestive phenomenon.

Interesting as are the immediate results of the administration of lead, it is in the remote effects that we are chiefly interested. The local alteration in large, hard, carcinomatous tumours, when this is observed to be following a satisfactory course, consists of a definite lobulation of the surface, as though the mass were breaking up into separate smaller tumours.

† I have long held the view that calcium ion in the blood has its source of origin in the [illegible] so-called "combined" or "masked"—calcium.

‡ Annett, H. E.: Rat Sarcoma, for which we are indebted to Dr. J. A. Murray, of the Imperial Cancer Research of the Royal College of Physicians and Surgeons, London.

At this juncture such cases should be subjected to X rays. Sarcomata may soften and liquefy, giving rise to serious complications; or, after the preliminary reaction, which is probably due to gradual liquefaction, they may be absorbed. Many patients who are improving under treatment accumulate fat rapidly. Whether this is due to a general improvement in their condition or to an action of lead on the lipins of the pituitary it is not at present possible to say. The remote general disturbances consist, of course, of the symptoms of lead poisoning to which I need not further refer. In a few cases we have used intramine, which is supposed to have the faculty of assisting in the elimination of the heavy metals, but I do not think we have observed any definite beneficial result follow the administration of this substance.

At this point I would emphasise the fact that lead poisoning in its grave forms is a very real danger. Yet, with increased experience in the estimation of the value of the changes in the blood and urine, in the interpretation of symptoms, and, above all, in the spacing of the doses according to the nature of the neoplasm and the individual tolerance of the patient, we now feel that the dangers to which the patients previously were exposed have been considerably lessened.

Types of Cases Treated.

From a summary of the cases treated I find that there is not a single early case. Some have been operable in the sense that we ourselves have operated usually in order to reduce or remove the mass of growth; and it is possible that one or two of the operations cured the patients. There is none, however, in which a favourable prognosis could have been given. In most the outlook has been hopeless. Two-thirds (81) of the total number of cases have been primary and one-third (41) secondary in origin. In many in which the disease was primary there were metastases. The following is a list of the sites of the primary lesions in our cases.

Carcinoma.—Mammæ, cervix uteri, rectum and colon, stomach, pancreas, œsophagus, tongue, tonsils, pharynx, superior maxilla, ovaries, parotid, kidney, mediastinum, glands of the neck, vulva and vagina.

Sarcoma.—Femur, humerus, scapula, sacrum, superior maxilla, small intestine, and (?) generalised involvement of abdominal lymphatic glands.

The results are summarised in the table below.

After-histories of Patients treated with Lead between Nov. 9th, 1920, and Nov. 9th, 1923.

Received intravenous injections	122
Alive and believed cured	19
Disease arrested or retarded over periods between one and three years	6
Under treatment and improving	6
Under treatment for too short a time for an opinion to be formed	7
Disease arrested, but patient died of intercurrent affection	1
Died from malignant or intercurrent disease shortly after treatment commenced	20
Have shown some improvement, but have subsequently died	13
Alive, but are not improving	2
Commenced treatment which was discontinued either because they were too ill or at their own request	18
Died from malignant disease without showing improvement	30

I do not propose to dwell on these statistics, for all statistics—like emulsions—are notably reversible. If I were to do so I might be tempted to remove from consideration those cases which died within a few weeks of being seen for the first time, those that died of intercurrent affections, those in which treatment was stopped, and those which have not been treated long enough for an opinion to be formed. I should then be left with a very satisfactory percentage of what we are content to call "believed cured." Time, however, is a factor that plays its part in the final estimation of results.

Discussion of the Clinical Work.

If I may draw provisional and conservative conclusions from our clinical work, which has been done on a fairly large scale, I must call attention in the first place to the fact that a large proportion of the material which we have received for treatment was totally unsuitable for any treatment—the cases were actually dying. Dr. William Mayo, who saw with me some of the worst cases then under treatment, said in his incisive way, "Surely you are expecting miracles, not cures." I am glad to say that so far his prognostications have not proved entirely correct and I think he would be interested to know that some of the cases are still alive and are better than when he saw them, if not well. Nevertheless, this great surgeon was right in one sense; the strain of having to expect "miraculous" happenings or death is not good for the mind or body of the surgeon.

In the second place, I would say that patients in good condition in whom the growth is inoperable, whether it be primary or secondary, should have the opportunity of treatment. There is nothing else that offers any hope. When the case is operable, I believe that the tumour should be removed and the patient treated immediately after operation to prevent recurrence. Serious radical operations with a large primary mortality—such as the extensive Wertheim operation for carcinoma of the cervix—may possibly be avoided if the patient can be treated after operation. Vaginal hysterectomy, for instance, even when the growth has not been entirely removed, has given encouraging results when intravenous injections of lead have subsequently been administered. Lastly it is safe to say, that the combined treatment, first with lead and subsequently with X rays, should be tried for all inoperable but accessible growths. Possibly ionisation followed by applications of X rays may be advisable in certain cases.

With regard to the future of the work I can say this: in the treatment of cancer there never can be a cure for all the dying cases we have seen—there is in some as much abnormal tissue as normal. I firmly believe that we are on the right—perhaps I should say "the best"—line of investigation and treatment. It is indeed, to my imperfect comprehension the only truly scientific path along which further advance can be made.

That we use lead is, perhaps, a confession of weakness; for, to return to my original hypothesis, when we have isolated or synthesised the biological substance—the somatic tissue secretion that controls the chorionic epithelium and cell correlation, for which I sought in vain—when we have done this we shall have, at least theoretically, a true specific. Meanwhile, we use lead, for it fulfils the experimental and often the clinical, demands made of it. I do not deny that there may be other substances that will do all that lead can do in regard to growth and be less toxic in other respects. All these considerations are included in our scheme of work.

In conclusion, I must acknowledge the generosity of our friends the members of the Cancer Research Committee, and the ability and cordial coöperation of my colleagues who have enabled the investigations to be prosecuted in so thorough and scientific a manner. I fear this presentation of the work has fallen far short of what is due to these endeavours.

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LEPROSY, A SELF-HEALING DISEASE.[1]

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Hansen[1] and others have stated that leprosy shows a tendency to spontaneous recovery in many cases; but the significance of this fact does not seem, as far as I am aware, to have been realised by modern writers on leprosy.

Immunity.

If we compare leprosy with the well-known self-healing diseases, such as lobar pneumonia, enteric, or small-pox, we notice a great difference in the course of leprosy as compared with these diseases. In the latter we have a short incubation period, a rapid onset and rise to a climax when immunity has become sufficient to cause more or less rapid diminution and disappearance of the disease, the whole course being finished within a comparatively few days. The object of this paper is to show that there is a similar process in leprosy, only that what happens in a few days in small-pox and enteric happens in as many years in leprosy. The length of time taken by leprosy to pass through all its stages (sometimes a whole life-time, though it is often much less) has obscured this fact regarding the nature of leprosy. Yet, as Newton learned much about the properties of the earth from a falling apple, so we may learn much about leprosy, the "king of diseases," from these short-lived fevers.

Leprosy resembles tuberculosis in many respects. In both diseases the bacillus is acid-fast. This property of acid-fastness is apparently due to some lipoid substance contained in the bacilli which directly or indirectly prevents the quick formation of immune bodies such as are formed in rapidly self-healing diseases. For this reason neither leprosy nor tuberculosis is a rapidly self-healing disease, although in both of them there is a slower and more gradual production of immunity.

While this is the chief point of resemblance between leprosy and tuberculosis, an important point of difference lies in the fact that, while tubercle attacks vital organs, leprosy confines itself almost entirely to the skin, mucous membrane, and peripheral nerves.* Thus, while tubercle is a fatal disease, leprosy is a disease of disfigurement and disablement and is seldom directly fatal except in the more active forms of the nodular type. The death of leprous patients is generally the result of complications many of which are preventable, or it is due to the inability of the patient to get work or to do work which will maintain him in the necessities of life.

A well-nourished leper may have nearly the whole surface of his body covered with skin every cubic millimetre of which contains billions of lepra bacilli and yet he may maintain comparatively good health, being able to work strenuously 12 hours a day and carry on a large business. No tuberculous patient harbouring even a far smaller number of tubercle bacilli could be expected to live for long. Thus, in tuberculosis, while there is a slow immunity-producing process present, death supervenes before sufficient immunity can be induced to cause self-healing of the disease; whereas in leprosy, which is seldom of itself a fatal disease, spontaneous recovery frequently takes place. The course of a typical case of leprosy may be indicated by a rising and falling curve, the summit of which denotes the point at which sufficient immunity has been induced to cause the gradual elimination of the disease from the body.

The course of leprosy may be conveniently divided into three stages. In the first, which corresponds with the beginning of the curve, the bacilli are few in number, the lesions are not widespread, and immunity is low. In the second stage, which corresponds with the rise of the curve, the bacilli have multiplied, but immunity is still low. In the third stage, which corresponds with the descent of the curve, lesions are widespread, but show signs of resolution and disappearance. Immunity has increased to such a degree that self-healing has begun to take place.

It is highly important to be able to recognise what stage of the disease a patient has reached. This can only be done with any certainty by the clinical appearance of the lesions. In cases in which there are widespread lesions, especially if these are lesions of the skin type and not of the nerve type, and if these lesions appear to be resolving, becoming less erythematous and swollen and presenting the typical appearance of resolved lesions, then it is not difficult to conclude that the patient has reached the third stage. I have described the appearances of such lesions more fully elsewhere.[3] [4] The recognition of the stage in leprosy is of vital importance both in the prognosis and the treatment.

General Resistance of the Tissues.

This must be clearly distinguished from acquired immunity. Various attempts have been made to inoculate leprosy on experimental animals, but, as far as I can judge, none of these attempts have as yet been successful. This is undoubtedly because the resistance of the tissues in these animals is too strong to allow of the bacilli multiplying and forming lesions. In other words, the tissues of these animals do not form a suitable soil for the growth of the leprosy germ. Various attempts have also been made to inoculate lepra bacilli on man. With one possible exception these also have failed, the reason probably being the same—viz., the general resistance of the tissues was too strong in these individuals so that they did not form a congenial soil for the growth of the lepra bacillus.

The onset of leprosy is almost invariably associated with the lowering of this general resistance in some way or other. The first signs of the disease frequently occur during or after some acute disease which has temporarily lowered the resistance, and these signs not infrequently subside once more as resistance is restored after recovery from the acute disease. This subsiding and disappearance of lesions must be clearly distinguished from the similar process which takes place in the third stage of leprosy due to the production of immunity. In the former case we have a restoration of the natural general resistance of the tissues which had been temporarily lowered; in the latter we have the formation of antibodies and the acquiring of special immunity to leprosy.

When, however, the onset of leprosy is associated with the lowering of the general resistance due to some cause which is neither temporary nor self-healing, leprosy continues to make headway in the tissues of the body until such time as one of three things occur: (*a*) The general resistance is restored, (*b*) the patient passes into the third stage and the disease becomes self-cured, or (*c*) the patient dies of some complication or of some other cause. Chief among such causes of prolonged lowered resistance may be named chronic bowel diseases, syphilis, and other chronic diseases, unsuitable diet, unfavourable climatic, sanitary, or economic conditions.

The Phases of Leprosy.

In acute infectious diseases the multiplication of the causal organisms is synchronous with acute toxic symptoms, toxins being set free by the bacilli as they multiply and in proportion to their numbers. In leprosy, however, the multiplication of bacilli may go on rapidly with but few toxic symptoms, and, as is mentioned above, huge numbers of bacilli may be present in the skin while the patient retains comparatively good health (Fig. 1). On the other hand,

* It is true that in fairly advanced cases of leprosy the bacilli are often found in the internal organs, but when the functions of the internal organs are severely affected it is generally due to amyloid or some other form of cell degeneration, the result of absorption of toxins from septic sores, and is not due, directly at least, to the presence of lepra bacilli in the affected organs. Exceptions to this are leprosy of the lungs and the testis, but the former is very rare and the latter, being painless, is seldom complained of and is certainly not likely to lead to a fatal result.

acute febrile and other toxic symptoms may occur while the number of bacilli is still comparatively small.

The apparent cause of this is that, as the bacilli multiply, they secrete a glutinous substance which fastens the newly-formed bacilli to the bacillary mass or to the cells lining the lymph spaces, and this substance, which envelops the bacilli, prevents the setting free of toxins. Under certain circumstances,

FIG. 1.

Photograph of a sweetmeat-seller who is able to carry on his business and enjoys fairly good health.

however, changes take place either locally or throughout the body which affect the bacilli and their glutinous matrix, toxins are set free, and febrile and other symptoms occur. Not only are toxins set free, but bacilli also are very often set free and carried to other parts of the body where, under favourable circumstances, they form new foci and lead to a further extension of the disease.

What the circumstances are which bring about the above-mentioned changes in the bacilli and their matrix I do not intend to discuss here, suffice it to say that the injection of certain drugs, the application of counter-irritation, and various febrile diseases are among the commonest causes.

The condition of leprous lesions may be conveniently divided into three phases according to their state at the time being, as judged by the appearance of the bacilli and their effects on the surrounding tissues. The first is the *quiescent* phase in which the bacilli multiply without giving out toxins. There is very little tissue reaction as shown by cell infiltration and fibrous tissue formation, and the bacilli are more or less uniform in shape, size, and staining. In the second or *reactionary* phase, toxins are set free and all the appearances of an inflammatory reaction are produced. There is an increase in the number of cells which infiltrate the lesions affected and dilatation of the capillaries and other local blood-vessels. Externally, the lesion is erythematous and raised bove the level of the surrounding normal skin. The acilli, instead of staining uniformly, stain only in parts, so that they have a dotted or granular appear ance; some of the bacilli stain uniformly faintly an others show spores or gonidia which, when stained fo half an hour in cold fuchsin and then decolorised fo two minutes in 10 per cent. nitric acid in absolut alcohol, take on a much darker stain than the ro part of the bacillus. These spores are more than twic the thickness of the rod and appear at the centr or end of the rod or else separately apart from th rod. There is good reason to believe that both th granular and the spore forms indicate that the bacil are either being destroyed or are at least in unfavou able conditions for growth and vegetation. Suc reactions may be local or general, some of the lesion or all of the lesions being affected. Part of a lesio or the whole of it may react and some of the bacil may be affected, others remaining as they were. I the third phase, which may be called the phase *resolution*, the swelling, erythema, and other signs the preceding inflammatory phase disappear. Ski lesions, which have reached this phase, will show th appearance of crushed tissue paper on the surface This is due to the thinning of the epithelium whic took place in the inflammatory phase as the result the pressure of the underlying corium, a wrinkle surface now showing as the inflammatory pressu has been removed. In this phase the cell infiltratio is replaced by fibrous tissue to a certain extent an the bacilli which have become granular during th inflammatory phase gradually disappear. The exten to which resolution takes place varies with the severit of the preceding reaction.

Leprous lesions are constantly passing throug these three phases, but, while the older lesions a reacting, the fresher lesions are spreading to th adjacent lymph spaces. This process may be see (Fig. 2) in radially-spreading, superficial lesions, an is very well shown in slightly pigmented skins whe we find an outer zone of depigmentation correspondin with the quiescent, non-inflammatory spread of th bacilli; inside this there is a raised, erythematou zone corresponding with the phase of reaction; whi in the centre erythema and swelling have bot disappeared, representing the phase of resolutio We may thus have the three phases coincidently i one lesion, or we may have the three phases succeedin one another, reaction having been suddenly set u in quiescent lesions due to some known or unknow cause and being followed by resolution.

In the reactionary phase not only is there settin free of toxins, but there is also setting free of bacil in the blood-stream. Many of these are carried a emboli to other parts of the skin and show thei presence by the formation of small inflammator nodules. In the third stage, or when in the first an second stages the general tissue resistance is sufficien these nodules quickly disappear, the bacillary embolu having been absorbed. When, however, either th general resistance or the acquired immunity are no sufficient to destroy the bacillary embolus it form the centre of a new focus from which the bacil spread once more through the lymph spaces.

Treatment.

In order to understand the lines along whic treatment may be successfully carried out, it i necessary to consider the significance of: (1) Th general body resistance; (2) immunity as indicate by the stage at which the patient has arrived; (3) th phases through which lesions pass to resolution.

It may be asked: "If leprosy is a self-healin disease like the acute, febrile diseases, what is th need of treatment?" The answer is that leprosy though not as a rule a fatal disease, is one of th most dreaded because of the deformity and disabl ment which it causes, and the object of treatment i to cut short its course in the first and second stage and, where it has already reached the third stage, t hasten the resolution of the lesions by causin moderate reactions.

A. In the first stage we have the disease in a limite form with few bacilli in the body, little or no acquire

immunity, and either diminished general resistance (temporary or permanent) or the presence of some other condition which is favourable to the increase of the disease. Attention in this stage must therefore be directed to: (1) The diagnosis and removal of whatever diseased condition, environment, or unsuitable diet is lowering the general tissue resistance or making the tissues a suitable medium for the growth of the lepra bacillus. (2) The induction of immunity by the injection of antigens. Defatted acid-fast bacilli may prove useful. (3) The destruction of lepra bacilli by the injection of preparations of fatty

FIG. 2.

Radially spreading leprous lesions of the back. Lepra bacilli could be found in the erythematous zone of some of these lesions. (From a coloured drawing.)

a = Large lesion caused by the coalition of smaller radially spreading lesions.
b = Depigmented outer spreading margin.
c = Erythematous inner spreading margin.
d = Scar left after resolution in centre of lesion.
e = Normal skin.

acids. I have found the esters of the fatty acids of hydnocarpus and chaulmoogra oils specially useful for this purpose. Counter-irritation by infiltrating esters into the subcutaneous tissue under skin and nerve lesions or by the external application of such substances as trichloracetic acid (a 1 in 3 solution in distilled water painted on to lesions every six or ten days).

B. In the second stage the same remedies should be used, but with more care. The bacilli are plentiful and there is grave danger that, in the absence of acquired immunity, further dissemination of the disease may take place, as is frequently the case if violent reactions are allowed to occur. Even greater stress must be laid on the necessity of increasing the general resistance. Theoretically, antigens in the form of defatted acid-fast bacilli should be useful, but I have not yet had sufficient experience of their value to speak with confidence. Trichloracetic acid used as mentioned above is very valuable. The esters of the fatty acids are very useful, but they must be used with great care especially if the general health is not good.

C. In the third stage, where a fair degree of immunity has been acquired, all the above-mentioned forms of treatment should be pressed. Vaccines, however, are not of much use as compared with the other forms of treatment. Considerable reactions are generally followed by marked improvement and there is not the danger of an increase of the disease which there is in the second stage. Large injections of the esters of fatty acids may be given, and, when these do not have sufficient reaction-producing effect, the reaction level may be lowered by the oral administration of potassium iodide, beginning with a daily dose of half a grain and gradually working up the dose to the limit of the patient's tolerance. Many patients will react with small doses of the esters when under the influence of potassium iodide in whom large doses of the esters without iodide produced no reaction. This effect is dependent on the presence of large numbers of lepra bacilli in the body. Many leprous patients will complain of severe pains in the limbs and head after the administration of a quarter to one grain daily for a few days. It is then well to stop its administration for a few days and to renew it after the pains have subsided. In all the stages of leprosy regulation of diet, abundant exercise, and careful regulation of the bowels are absolutely essential if good results are to be obtained. I have dealt with the details of treatment elsewhere.[2] [4]

Prognosis.

The fact that leprosy is a self-healing disease is also of great importance in the prognosis. When a case has passed through the third stage there is but little chance of recurrence of the disease. In India many of the begging lepers who present their deformed limbs to passers-by in the hope of exciting pity are no longer suffering from the active disease. Careful post-mortem examination fails to find any lepra bacilli. In many of such cases perforating and other ulcers from which they suffer are trophic and are due either directly to defective nerve-supply following fibrosis of the peripheral nerves or to burns and cuts incurred through anæsthesia and insensibility to injuries. Such cases are almost entirely the result of neglect, but they cannot be said to be suffering from leprosy after lepra bacilli have been eliminated from the body. Many of them are cures of Nature, though the cure may be considered as worse than the disease, and they illustrate the fact that leprosy has a tendency to self-healing.

Under careful treatment, however, leprosy may heal with little or no deformity; and, when the patient has passed through the third stage, there is good reason to believe that there is sufficient immunity to ensure that there is only a remote chance, if any, of a return of active disease. When a patient, who has passed through the third stage, has, during a period of two years, given only negative results on repeated bacteriological examinations, and when there has been during that period no sign of fresh anæsthetic lesions and no increase in the size of any of the existing ones, I consider that he is cured. If, however, lesions have disappeared with or without treatment during the first or second stage, and two years with negative bacteriological examinations have passed; or, in nerve leprosy, if the anæsthetic lesions have to a great extent regained sensation and no new lesions have appeared during that period nor have any of the old lesions increased in size, the case should be considered one of *relative* cure, though the absence of immunity does not justify the prognosis of an *absolute* cure.

Cases such as have been referred to above, where the general resistance of the tissues has been lowered by some temporary cause, such as an acute fever, and the leprous signs, which have appeared during the period of lowered resistance, disappear again as the resistance returns—such cases must be distinguished from those in which the disappearance of leprous lesions is due to acquired special immunity. Recurrence is not uncommon in the former if at any future date the general resistance is again lowered; recurrence in the latter seldom or never occurs.

Obviously, one of the chief difficulties which will arise in the mind of the reader is how to tell with certainty which particular stage the patient has reached. I have dealt with this in more detail elsewhere.[3] To anyone who is familiar with the appearance of resolved and resolving leprous lesions the difficulty is not so great as would at first appear. There is, of course, no clear-cut line between the different stages, but in a case which has advanced as far as the doubtful border-line between the second and third stages, no harm will be done by treating the case as one in the third stage. Unfortunately, no complement-fixation or other serum reaction has been discovered which is of any value in testing the specific immunity in leprosy and we must rely for our evidence upon clinical signs.

Summary.

1. Leprosy is a self-healing disease, in typical cases of which immunity is gradually produced.

2. Delay in immunity production is due to the nature of lepra bacilli which are able to multiply with few or no signs of local or general toxæmia.

3. During the first two stages of leprosy it is most important to restore the lowered tissue resistance, otherwise the disease may pass on into the third stage.

4. In the third stage, where immunity has been produced, it is important to bring about moderate reactions so as to hasten the resolution of the lesions before deformity and disablement can take place.

5. In cases which have passed through the third stage an absolute cure may be hoped for as far, in many cases, as the active disease is concerned; while in cases which have recovered without passing through the third stage the cure can only be considered a relative one, recurrence being possible should the tissue resistance be seriously lowered at any future time.

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THE EFFECT OF ALTERATION OF TEMPERATURE UPON THE RATE OF THE ISOLATED HEART.

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ON theoretical grounds it can be shown[1] that the effect of heat upon the velocity of a chemical reaction should obey a certain law which can be expressed symbolically as follows:—

$$\log \frac{K_2}{K_1} = \frac{Q}{2} \frac{(T_2 - T_1)}{T_1 T_2}$$

where K_1 and K_2 are the reaction velocities at the absolute temperatures T_1 and T_2 respectively, and Q is a constant.

This is known as the Van't Hoff-Arrhenius law, and has been found in practice to hold good for all chemical reactions.

There are many vital processes which have been shown by various observers to be affected by temperature in accordance with the same law. Barcroft, for instance, found that the dissociation of oxyhæmoglobin, at various temperatures, takes place in agreement with this law, a point of some considerable importance to the animal body, since the increased dissociation of oxyhæmoglobin resulting from the rise of temperature produced by ordinary muscular work provides more free oxygen for the increased needs of the active tissues. The development of the tadpole has been shown by O. Hertwig to follow the same law[2]; phagocytosis is another interesting example, according to Madsen,[3] of the same thing, whilst the law of increased conductivity of a nerve under rise of temperature is well known to everybody.

In a paper by one of us (A. J. C.) upon the effect of temperature on the frequency of the heart,[4] the statement was made: "In both the frog and the rabbit the frequency of the heart is not a linear function of the temperature, nor is it a simple logarithmic function." This statement requires modification, for we find that when numerical results upon which that statement was based are subjected to exact mathematical analysis they are found to obey the Van't Hoff-Arrhenius law in a very satisfactory manner. Thus, in the case of the isolated auricle of the rabbit's heart the figures shown in Table I. were obtained:—

TABLE I.

Temperature (Centigrade)	15	25	30	34	38
Rate (per minute)	25	64	82	120	170

Using the Van't Hoff-Arrhenius formula we get values of Q which range between 13,730 and 16,130, with a mean value of Q = 14,835. The maximum deviation from the mean—i.e., 1295 (viz., 16,130 − 14,835) can be shown by statistical methods[5] to be within the limits of experimental error.

If now we use this value of Q to calculate the theoretical rate of the auricle at the given temperatures, we obtain the figures given in Table II.:—

TABLE II.

Temperature		15	25	30	34	38
Rate	Observed	25	64	82	120	170
	Calculated	(25)	59·5	89·6	123·4	174·3

It will be seen that the agreement between the calculated and observed results is a very satisfactory one. When the original figures are plotted, the resulting graph is neither a straight line nor a simple logarithmic function, but if we plot the logarithms of the corrected (calculated) figures against temperature the graph is a straight line, as we should expect.

In another set of experiments with the frog's heart (perfused with alkaline Ringer of pH = 9), given in the paper referred to, we find the observed and calculated results at various temperatures to be as shown in Table III.:—

TABLE III.

Temperature	0·4	5·6	6·4	12·8	13·6	14	16	21	29·5
Rate—									
Observed	5·9	11·7	13·25	25·25	26	30	36	52·5	84–92
Calculated	(5·9)	10	12·28	25·89	28·41	29·7	37·9	64·3	156

So that up to a temperature of 20° the agreement is excellent. It is possible that at a higher temperature there is a coagulation or other chemical change of the protoplasm of the frog's heart which accounts for the divergences between the expected and observed results at 21°, and especially at 29·5°. Similarly, it would appear that normal Ringer, with weak buffer ($NaHCO_3 = 0{\cdot}015\%$; pH = 8) has some chemical influence upon the heart muscle, since experiments carried out with isolated frog's heart perfused with that solution give results which are not in agreement with the Van't Hoff-Arrhenius law.

It would be interesting to have exact observations of the normal pulse-rate in man under the normal cyclical daily variations in temperature. Such observations would be of value from the point of view of variations of pulse-rate under various pyrexial conditions, inasmuch as they would enable one to ascertain whether any particular pyrexial condition

has or has not a chemical action upon the protoplasm of the cardiac musculature. This is a point which we hope to investigate in the near future.

Conclusions.

1. The rates of the isolated heart of the frog and rabbit under different temperatures are such as would be expected from the Van't Hoff-Arrhenius law.

2. Within certain ranges of temperature it is possible to foretell by means of that formula what the rate of the heart should be under any particular temperature.

3. Marked divergences between the observed and calculated results—when gross errors of observation can be eliminated—point to some chemical changes in the heart muscle, due either to the high temperature or to nutritive fluid supplying the heart.

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ACIDOSIS IN RELATION TO ACUTE RICKETS.

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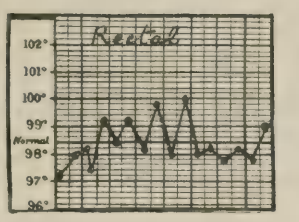
IN view of recent discussion of the nomenclature of this subject it should be stated at the outset that the term acidosis, as used in this preliminary communication, refers to a variation in the acid-base equilibrium in the blood, with a lowered plasma bicarbonate, and not to any particular form of acid intoxication. Evidence has been accumulating, from many sources, that acute rickets is frequently associated with a condition of acidosis, since this was first described by Hertzmann in 1873.[1] The subject has recently been revived by Pritchard[2] and others, who regard acidosis, however produced, as the *essential* factor in the ætiology of this disease. Such a theory appears to be based largely upon determinations of the calcium and phosphorus content of the blood and excreta, together with estimations of the ammonia-nitrogen and the detection of acetone bodies in the urine. So far as we have been able to ascertain, no direct measurements of the alkaline reserve of the blood in acute rickets have yet been published; we have recently had the opportunity of making such investigations, together with observations on the urine and fæces in three cases of acute rickets, and believe, therefore, that the publication of a preliminary communication embodying our results, few as they are, may be of value to other workers in this field.

Notes of Cases.

On account of the difficulty of obtaining a precise definition of a condition so protean in its manifestations as acute rickets, and realising that the title is ambiguous, it has been deemed advisable to give a somewhat detailed clinical description of the cases studied.

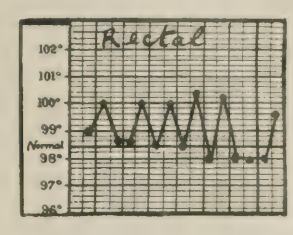
CASE 1.—Female, aged 3, a full-time child weighing 6½ lb. at birth. Entirely breast-fed and weaned at 13 months. Had measles at 2 years, after which she walked badly and "fell about." Home situated in a very poor neighbourhood, the total family income (parents and two children) being 22s. per week. For the past 18 months the average diet consisted of:—Breakfast: bread, margarine, tea, and occasionally an egg; dinner: always some kind of meat, potatoes, and greens, and sometimes a rice pudding; tea: bread and margarine. In June, 1923, she was noticed to be very fretful and listless and began to sweat more than usual. She was admitted to hospital on July 9th, 1923, under Dr. H. C. Cameron, as a case of acute rickets. The most striking clinical feature was the extreme hypotonia of the limbs and musculature generally. There was slight pyrexia (Chart 1) but no obvious anæmia. The spleen was not palpable. Beading of the ribs was marked, and there was considerable enlargement of the wrists and ankles; bowing of the tibiæ was also present. X ray examination of the epiphyses showed cupping, and the typical appearance of acute or florid rickets. The child was placed in a cot so situated that she was not in direct sunlight, and was put on light full diet, comprising bread, butter, milk, potatoes, green vegetables, cooked meat, rice pudding made with milk, and water as required. No cod-liver oil or other medicine was given.

FIG. 1.



Case 1.—Temperature chart, July 9th–16th.

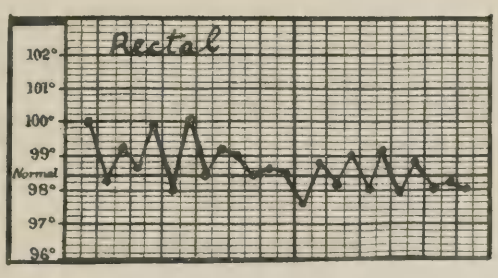
FIG. 2.



Case 2.—Temperature chart, July 9th–16th.

CASE 2.—Female, aged 18 months, sister of Case 1, living under the same home conditions, and on practically the same diet. No history of any previous illnesses. Symptoms the same as in Case 1, and began about the same time. On admission on July 9th, 1923, the chief feature was the extreme hypotonia. There was slight pyrexia (Chart 2). Clinically, there was no difference between the two cases as regards the severity of the process, but X ray examination showed slightly less bony change in Case 2. She was placed in an adjacent cot, and on the same diet as her sister, and was not given cod-liver oil or other medicine.

FIG. 3.



Case 3.—Temperature chart, August 29th–Sept. 10th.

CASE 3.—Male, aged 1 year and 8 months, the youngest of three children. A full-time child, breast-fed for three months, then given cows' milk and barley-water. For the last seven months he had been having a diet as follows:—Breakfast: bread, margarine, sugar, and jam; cows' milk 1 pint per diem; dinner: mashed potatoes, gravy, rice; tea: milk, bread, and margarine. Had been crawling about for some time, but does not stand or talk. It was not possible to determine the date of onset of the symptoms. Anterior fontanelle still patent; marked beading of ribs, and enlargement of wrists and ankles. As in Cases 1 and 2, the most striking feature was the extreme hypotonia. Slight pyrexia (see Chart 3). X ray examination showed advanced rickety changes and cupping of about the same degree as Case 1. This case was in hospital on the same diet as the two previous cases, and was not given cod-liver oil or other medicine. The investigations were carried out 24 hours after admission.

The cases were confined to bed throughout the period under review.

We wish to emphasise the "acuteness" of the process in the above cases, and as this stage probably

only lasts for a comparatively short period, a few weeks at the most, it is important that observations such as are recorded here should be undertaken quite early in the disease.

*Investigations and Methods.**

The investigations carried out comprised determinations of the bicarbonate content of the plasma from venous blood, and in Case 3 the acetone bodies in the blood. Quantitative estimations were made of the total acetone bodies and the ammonia-nitrogen ratio in the urine. Special precautions were taken in collecting the specimens to ensure that no ammonia should be introduced from without. The specimens were collected into sterile and specially cleaned bottles. Bacteriological examination of the specimens remained sterile up to 72 hours. In Case 3 the percentage of fat in the fæces was determined. The plasma bicarbonate values were obtained by the titration method of Van Slyke, Stillman, and Cullen[3] the full precautions indicated in their paper being carried out. Instead, however, of determining the reaction of each sample of blood taken, the titration was made to a constant end-point pH 7·4. The results are expressed as molar concentration of bicarbonate, each figure being the average of at least two readings. The total acetone bodies in the blood were estimated by the method of Van Slyke and Fitz.[4]

The total acetone bodies in the urine were determined by the method of Van Slyke,[5] the mercuric precipitate being dissolved in dilute hydrochloric acid and titrated with potassium iodide as described in his paper. The results are expressed as molecular concentration of acetone. The ammonia-nitrogen was determined by formol titration: the fat content of the fæces by the Schmidt-Werner method (as used by Cammidge).

Control observations were carried out both on blood and urine of other children in the ward convalescent from various disorders other than rickets. Unfortunately, the control figures for blood and urine were not obtained from the same cases. Both Cases 1 and 2 were in hospital for three days before observations were commenced.

Results.

Blood.—The values obtained for the plasma bicarbonate were: Case 1, 0·0174; Case 2, 0·0190; Case 3, 0·0183. The average value in the controls was 0·0313, which approximates very closely to the figure obtained with this method in a larger series of normal adults—viz., 0·0345 (males) and 0·0319 (females). A further determination on Case 1 after a period of 11 days, during which time the acetone bodies had disappeared from the urine, gave a value $NaHCO_3 = 0·0166$.

It is unfortunate that the figures obtained are so few, but it is scarcely possible to obtain repeated samples of blood from young children whilst observing all the precautions necessary for accurate work with this method. In Case 3 the blood withdrawn at the same time as the sample on which the plasma bicarbonate determination was carried out was examined for acetone bodies. They were found to be entirely absent from the blood.

Urine.—In Case 1, on the first two days of investigation, the urine gave a strong Legal reaction for acetone bodies, but the ferric chloride reaction was negative. A quantitative estimation of the acetone bodies was only carried out on the first day, as it was impossible to obtain a sufficiently large specimen on the second day. The value on the first day was 0·0096. No acetone bodies were present in the urine of Case 1 after the second day. In Case 2 the difficulty of obtaining specimens was much greater. Only on two occasions could a sufficient quantity be obtained. These contained no acetone bodies. No acetone bodies were present in the urine of the control cases. In the cases under consideration the average NH_3/N_2 ratio was 14·3 per cent. In a series of controls the average value was 7·04 per cent. These figures for the NH_3/N_2 ratio correspond approximately with those obtained by Dr. Amy Hodgson,[7] who obtained an average NH_3/N_2 ratio of 14·3 per cent. in 13 cases of rickets, as compared with 6·2 per cent. in a series of normal children. The results are expressed below in tabular form so that the dates on which determinations were made can be clearly seen and compared.

Case.	Date in 1923	$NaHCO_3$.	NH_3/N_2 per cent.	Acetone in urine.	FeCl.	Legal.	Roths.
1.	12/7	0·0174	14·1	0·0096	−ve	++ve	++ve
	13/7		13·8		−ve	++ve	++ve
	16/7		11·9	Nil.	−ve	−ve	−ve
	23/7	0·0166		,,	−ve	−ve	−ve
2.	12/7	0·0190		,,	−ve	−ve	−ve
	14/7		14·1	,,	−ve	−ve	−ve
3.	30/8	0·0183	17·6	,,	−ve	−ve	−ve

Fæces.—The fæces of Case 3 contained 17·5 per cent. of fat. The following report on the fæces of Case 1 was made by Dr. J. H. Ryffel: "Fæces are loose. Acid to litmus, not to Congo-red. No appreciable excess of fat. Stain blue with iodine, staining being due to granules which look more like yeasts than starch grains."

Discussion of Results.

The results recorded above, although few in number, by their variety and in comparison with the results of other workers, indicate a line of research which we shall hope to pursue when further material becomes available. The results of determinations of the plasma bicarbonate and acetone bodies in the blood and urine form an interesting comparison with figures recently obtained in a series of cases of diabetes mellitus.[8] In the latter cases it was found that the diminution of the plasma bicarbonate corresponded fairly closely with the total acetone bodies present in the blood; this, as we have shown, is far from being the case in acute rickets, although in each case there was marked diminution in the alkali reserve. In two out of the three cases no acetone bodies were present while in the other case, although the plasma bicarbonate was still lower 11 days after the first observations were made, the ketosis disappeared after four days and did not reappear. So far our results would tend to show that there is a severe acidosis in acute rickets in which the acetone bodies play no part. This would lead to the conclusion that the acidosis is due to one or both of the following factors: (1) Loss of bases by some other channel—e.g., fæces or urine; (2) some other acid bodies present in the blood. With regard to the former, Dodds[9] records a high fat content in the fæces of children suffering from acute rickets, and concludes that there is evidence of pancreatic disorder in acute rickets. Braithwaite[10] however, was unable to confirm this result, and points out that Dodds neither defined the term acute rickets nor stated in his article whether the cases were having cod-liver oil and malt as part of their treatment. In Case 3, in which we determined the percentage of fat in the fæces, our results were in agreement with those of Braithwaite, since we obtained a normal figure. Dr. Ryffel's report on the fæces in Case 1 seems to point in the same direction. The second point—viz., whether there are other acid bodies circulating in the blood, thus causing a depletion of the alkaline reserve, is at present a matter of pure conjecture.

In conclusion, we wish to express our thanks to Dr. H. C. Cameron for permitting us to investigate his cases, to Dr. W. W. Payne and Dr. E. P. Poulton for kindly help and criticism, and to Dr. J. H. Ryffel for placing the resources of his laboratory at our disposal. One of us (N. B.) wishes to acknowledge with thanks a grant from the Parsons Research Fund.

(*Continued at foot of next page.*)

* It may be of interest to note that the weather during the course of the investigations of Cases 1 and 2 was extremely hot, the shade temperature (ward) at the time the first two blood samples were taken being 82° F.

BACKACHE.*

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BACKACHE is such a common complaint, is associated with so many different conditions, receives as a rule such scant consideration, that no apology is needed for bringing it forward for discussion. Straub [1] states that it is not only one of the commonest complaints, but that, "ætiologically considered, it is one of the most difficult to deal with," and that "in no field of medicine is there greater ignorance as to . . . . cause and conditions."

I turn to Lovett's [2] paper of 1914, a paper full of interest, for the introduction to my argument. Lovett dealt with chronic backache; the following is a slightly modified form of his classification:—

Backache: Lovett's Classification (1914), Modified.

1. *Gynæcological: Disease or Displacement.*
   (*a*) Direct reflex influence.
   (*b*) Flexed position of body = Fatigue or strain of erector muscles.
2. *Traumatic.*
   (*a*) Arthritis of spine.
   (*b*) Defective balance = Fatigue or strain of erector muscles.
3. *Arthritis of Spine.*
   (*a*) Stimulation of pain fibres.
   (*b*) ? Lowered resistance of body = Fatigue or strain of erector muscles.
4. *Other Local Origin.*
   (A) Static in origin.
   (*a*) Skeletal peculiarities: shortness of one leg, body inclined sideways.†
   (*b*) Lack of proper muscular control—
   "Slumped attitude" } Body inclined forwards.†
   ? Flat-foot }
   (*c*) Abnormal conditions of abdomen—
   Corpulence } Body inclined backwards.†
   (Advanced pregnancy) }
   (B) Sacro-iliac joint—
   (*a*) Strain of—Attitudinal.†
   (*b*) Relaxation of—Non-proven.‡

† Fatigue of erector spinæ muscles.
‡ It must be left to orthopædists to decide whether this opinion stands to-day.

Lovett left out many conditions in which backache may be complained of—caries, cancer, hydatid of the spine, aneurysm, pneumonia, pleurisy, renal calculus, nephromata, gall-stones, appendicitis, ovarian tumours, fibroids, cancer of the womb, nephroptosis, organic nervous disease, small-pox, and influenza. But by excluding all these he emphasises the great rôle played by fatigue of the back muscles in the causation of backache in the types he considers. It therefore seemed advisable to get at the cause of this fatigue of the erectors, and, as a corset was nearly always found to benefit the patient greatly, to ascertain the way in which the corset acts. Flat-foot and similar conditions, according to Lovett, occasion backache by inducing disturbance in antero-posterior balance.

Backache and the Erector Spinæ Muscles.

Two questions then arise: First, how can flat-foot per se cause backache? Does it occasion strain of the erector muscles; and, if so, how? Secondly, is backache, in the types of case mentioned, due to strain or fatigue of the erector muscles; and, if so, how is it that the therapeutic corset relieves? If backache of these types is not due to strain of the erector spinæ muscles, to what is it due? I address myself to the second of these questions, leaving the first to the orthopædist and to the general practitioner. It seems to me, however, that the flat-foot and backache, which apparently appear so often in conjunction, are due to a common cause—a general bodily weakness or depression of the vital forces. Flat-foot must be attributed to a general depression; or, if purely local, it must have some special cause. It is a result of too much strain on the tibialis posticus and allied muscles; but why should these become incapable of performing their function efficiently, if the general resistance of the individual is not depreciated and the bodily vigour remains good? I consider it significant that in a patient with flat-feet mentioned by Lovett, complete freedom from backache did not occur until a corset was applied. The fact that omission to wear the foot-plates was marked by a return of the backache which disappeared with their renewal is interesting, and essentially an orthopædic question. The effect of the corset, applied especially to the lower abdomen, is what interests me; my argument is that it favourably affects general metabolism and thus not only relieves strain of the erector muscles but assists in the performance of function by all body parts, and thus materially participates in the recuperation of such a condition as flat-foot.

Leaving aside for a moment Lovett's defect in lateral balance, it is rather interesting to observe that he depicts two different types of defect in antero-posterior balance. On the one hand, he attributes the backache of gynæcological disease and of "slumped attitude" to the patient inclining the body forwards; and on the other, the backache of corpulent people to the enlargement of the abdomen, in which case the body is inclined backwards. These two attitudes are essentially different in one particular: in the former, owing to the flexion of the spine, the erector muscles are extended—lengthened—stretched; in the latter, owing to the extension of the spine, the erector muscles are almost as short as they can be. In the former case, in spite of their extended state, they have to contract more strongly than if the individual were erect—and it is not surprising that under such conditions they should become easily fatigued. Backache is perhaps most readily induced in normal healthy man by his working in an unaccustomed stooping position; how often does one hear of patients being afflicted with lumbago after digging in the garden! You will see at once that the erector muscles are maintained unduly stretched by the attitude, but that at the same time they must work harder, contract more strongly, than during such an exercise as walking. In the other type of case—that of a corpulent man or that of a woman in advanced pregnancy—though the protrusion of the abdomen carries the centre of gravity forwards, the shoulders are thrust back, so that an equipoise is obtained. To maintain the shoulders back, to carry the trunk and head erect, the erector muscles must surely do more work than in a healthy non-corpulent or non-pregnant individual.

Is this, then, the cause of the backache in these cases? That it is so seems indicated by a case of defect in lateral balance, cited by Lovett; with an inch shortening of one leg, the patient complained of backache and was cured by a high sole on the boot of the shorter leg. In this case the backache can only have been due to the extra work thrown on the erector spinæ, which had to do its work in a stretched

* Read at a meeting of the Rugby and District Medical Society, Dec. 1st, 1923.

[1] Straub: The Diagnosis of Conditions Causing Backache, Jour. Amer. Med. Assoc., 1923, vol. lxxx., 674.

[2] Lovett: The Causes and Treatment of Chronic Backache, Jour. Amer. Med. Assoc., 1914, vol. lxii., 1615.

Acidosis in Relation to Acute Rickets: References.

(*Continued from previous page.*)

1. Hertzmann: See Medical Research Council Reports: Studies of Rickets in Vienna, 1919–1922. Special Reports No. 77.
2. Pritchard, E.: Brit. Med. Jour., 1923, i., 887.
3. Van Slyke, Stillman, and Cullen: Jour. Biol. Chem., 1919, xxxviii., 167.
4. Van Slyke and Fitz: Ibid., 1917, xxxii., 495.
5. Van Slyke: Ibid., 1917, xxxii., 455.
6. Cook, F., and Osman, A. A.: Guy's Hosp. Rep., No. 2, April, 1923, lxxiii., 233.
7. Hodgson, Amy: THE LANCET, 1921, ii., 945.
8. Burgess, N., Campbell, J. M. H., Osman, Payne, W. W., and Poulton, E. P.: Ibid., 1923, ii., 777.
9. Dodds, E. C.: Brit. Med. Jour., 1922, i., 511.
10. Braithwaite, J. V. C.: Ibid., 1922, i., 739.

state because of the lateral deviation of the spine which the condition determined. But if we accept this as a cause of the backache in this case, and attribute the backache in corpulent people to the increased strain on the erector muscles, we are immediately met with a difficulty. If the erector muscles, because of the attitude, have to work harder—if the backache in these cases is due to the extra strain thrown on these muscles—why do they not hypertrophy, and by increasing in mass, become able to deal with the situation?

The Basis of Muscle Hypertrophy.

Nothing in medicine is more fascinating than the study of the reactions of muscle. Life is simply a series of postures and movements; to understand these is to understand all. A consideration of the mechanism of muscle hypertrophy—of the determining and opposing factors—throws much light on many vital processes. One of the important features to remember is that an increase in work is not the only factor brought into play; besides the demand for an increase in contractions—tonic and other—an increased blood supply is necessary. This is required not only to ensure an adequate oxygen and foodstuff supply, but especially for the removal of the katabolic products, now increased. Similarly, the blood must be of a certain quality—it must not already be laden with too great a percentage of waste products, nor must it be deficient in those bodies on which anabolism depends. In short, the visceral machinery must be in such a state that it can not only furnish an adequate amount of blood per unit of time to the tissue in question, but of blood of adequate quality. To effect this it must be working at less than top speed—that is to say, it must be in such a state that it can respond to the needs of the moment, to the increasing demands now made on it; and, if these persist, can itself hypertrophy. In people with lax abdominal walls—whether corpulent or not—and in certain cases of pregnancy this machinery is not at its best: the conditions for hypertrophy do not sufficiently obtain, organs have to do more work than they can, strains thus accrue when they should not, and fatigue is experienced sooner than it ought.

The Working of Intra-Abdominal Pressure.

A word as to how this intra-abdominal pressure works—the pressure due to the contractile activities of the abdominal muscles, especially of the flank muscles, acting as they do in concert with the thoracic diaphragm and pelvic floor. This pressure works in two ways. How it affects the visceral capillary circulation, the flow of blood per unit of time through the stomach and intestines, the pancreas and spleen, the liver and kidneys: how it tends to flatten the visceral capillaries and conversely occasions reflexly a corresponding dilatation of the supplying visceral arterioles (other forces remaining the same) are questions with which space will not permit me to deal. I wish, on this occasion, to emphasise the other more obvious effect of the intra-abdominal pressure, its effect on the heart—that is, on the output from the left ventricle—and its effect, consequently, on the aortic blood pressure. The intra-abdominal pressure has this effect by controlling or influencing the supply of blood to the heart (right auricle). If the supply of blood to the heart is poor, the output must correspond, so must the aortic pressure. There are only three regions—omitting the skin and subcutaneous tissues—from which blood is returned to the heart (right auricle): these are the skull, the limbs, and the abdomen. Owing to the nature of the skull, blood cannot accumulate within this part. The limb muscles, too, are invested with inextensible aponeurotic membranes, so that blood cannot accumulate to any extent in the limbs. But in the abdomen it is different; there great variations in volume and capacity are constantly occurring, and with lax abdominal walls, blood can readily accumulate. By applying an efficient corset or belt the pressure within is raised, the blood can less readily accumulate, more per unit of time is pressed into the thorax and right auricle, reaches the left ventricle, and is thrust into the aorta. The aortic blood pressure thus rises, more blood per unit of time thus traverses the brain, the limb muscles and back muscles, the viscera of the abdomen. The whole individual becomes improved; muscles or glands or other parts, which before could not hypertrophy in spite of increasing demands made upon them, find themselves now able to deal with the situation in hand. The tonic contraction of muscle is greater, the cerebral response is enhanced, gland activity is increased—the neurasthenic gets well. It is not surprising that, if backache in the cases mentioned is due to fatigue spasm or strain of the erector muscles, such a measure should relieve the condition. The success of the treatment is an indication of the soundness of the explanation, and if it is applied in practice most gratifying results will be obtained.

Surgical Treatment of Backache.

So much for the academic consideration of backache. I have already taken up so much of your time that I do not intend to discuss at length the cases of backache which have come under my care, but before I close I should like to say something about the surgical treatment of backache. By this I do not allude to those measures orthopædists may practise, such as stretching the gastrocnemii, and such like; nor am I thinking of those operations by which the backache incident to inflammatory or other disease of the pelvic viscera is cured or relieved, or of the effect of nephropexy in this respect; I am thinking of specific conditions of the abdominal wall and of the pelvic floor, in virtue of which "static backache" arises, and of procedures by which the functions of these important musculatures can to a very large extent and in some cases completely be restored to normal.

It is clear, if the abdominal wall be lax, that a corset or belt, however well it fit, can only be effective in raising the intra-abdominal pressure if the pressure-resisting mechanism occluding the pelvic outlet be efficient. In patients suffering from so-called relaxed vaginal outlet, a condition in which the pelvic floor musculature is not efficient and does not act as the sphincter it should, the application of a corset or belt will only tend to make worse the backache and bearing-down pains, of which the patient complains or exaggerate the visceral extrusion which may already exist. To cure the patient, the pelvic floor itself must first be restored and the genital extrusion prevented. But lesions of the abdominal wall and pelvic floor, the common results of pregnancy and parturition respectively, are not always coexistent. Even in multiparous woman, with a markedly lax abdominal wall, one may yet find the pelvic floor in good condition and the vaginal orifice tightly screwed up. In such a case, attention to the abdominal wall alone is needed. On the other hand, it is frequent to find with a lax abdomen a lax or inefficient pelvic floor.

In practice I divide these patients into two classes according to their age, according as to whether or not they have passed the climacteric. After the climacteric, when the uterus is of no further service, and if malignancy can be confidently excluded, the interposition operation is best. The cervix is amputated, and the body of the uterus brought down and fixed beneath the bladder, between it and the anterior vaginal wall. In this position it acts as a natural pessary and cures effectually the cystocele so common in these cases and the incontinence of urine from which so many of the patients suffer. In younger women the ideal is to restore the displaced levator muscle to its proper position. During birth the muscle border is always more or less torn from its bony origin in front, and during the lying-in it takes up a more lateral anterior attachment, becoming more oblique. This change in position, which can readily be demonstrated clinically, results in a permanent widening of the pelvic floor aperture, and in marked cases is commonly associated with incapacitating bearing-down pains and

backache and the imminence of prolapse. The operation I have been practising, and from which I have been obtaining some good results, consists in exposing the muscle, severing it from its present more or less lateral attachment, and uniting it by sutures to the pubic arch near the middle line. By this means—if the new attachment persists—the pelvic floor aperture is much narrowed and the muscle becomes again efficient as a sphincter to the pelvis. In cases in which this has been done, and in which the abdominal wall is lax, a belt can now be worn with much advantage.

Inefficiency of the Abdominal Wall.

In other cases one finds the abdominal wall hopelessly inefficient. Examples of two types of case have come before me. In one, the linea alba is greatly stretched and remains so or gradually gets worse; in the other, the conspicuous feature is not a persistent separation of the recti, but marked laxness of the flank muscles outside. Examination of the abdominal wall in strained conditions brings out these features. By getting the patient when lying supine to raise the head and shoulders, the separation of the recti, if present, becomes clearly evident; whilst if a weakness of the flank muscles is the feature of the case, one can see these bulge at times extraordinarily. In such cases, the application of a corset or belt cannot hope to restore the function—if a belt be used the redundant abdominal wall rolls over it in an annoying fashion—but much benefit may accrue from surgical measures. I cite you two examples:—

A corpulent woman of 45, the mother of ten children, the last 5 years of age, consulted me complaining of backache. There was considerable separation of the recti, three or four inches at the level of the navel: the pelvic floor aperture was not much enlarged, but a small rectocele was present. On April 30th, 1923, I exposed the stretched aponeurosis between the recti in the whole of its extent, and pleated it longitudinally, so that at the end of the operation the separation was gone. A small colpo-perineorrhaphy was done at the same time. On Oct. 23rd the patient reported: she said she was "ever so well," she had had no further backache or bearing-down pains. The incision in the abdominal wall was then 13 in. long, and the girth of the abdomen 46½ in.

The other case is that of a woman who has suffered much at my hands:—

The patient is 57 years of age. Four years ago I removed the uterus for bleeding due to fibroids. In spite of wearing an abdominal belt from her convalescence, in about six months' time she complained of bad pain in her back and right thigh. Examination revealed considerable prolapse of the right kidney, which was stitched up in October, 1920. She got on fairly well until the spring of 1922, when backache was again a cause of complaint. I thought the pelvic floor was slackening and advised a pessary and a larger pad to the Curtis support. This relieved for a while, but at the end of that year the patient complained of a "dreadful pain" in the back "and through to the front." She stated she was always in pain, "could not sleep or lie still in bed," and "could not sit for many minutes in one position."

The abdominal wall was exceedingly lax, especially laterally; and on the left side in the region of the anterior superior spine of the ilium a hernia seemed present. Examination revealed the pelvic floor aperture in a fairly good condition: the pessary apparently had done some good. At my wits' end to know what to do for this patient, who was constantly coming to see me, I determined to advise doing a modified Lotheissen's operation on both sides—that is to say, bringing down the lower edge of the transversalis and internal oblique and stitching them to the ascending ramus of the pubes. This was done on both sides on Feb. 19th, 1923, a hernial protrusion being found on the left side as previously indicated. Unhappily, on coming out of the anæsthetic, the patient was found to be suffering from hemiplegia—evidently due to a cerebral thrombosis. She gradually recovered from this, and quite early in her convalescence stated that her backache had gone. Writing nine weeks after operation, she said: "I have not had any pain either in my back or at my front and I begin to feel much better than I have done for several years."

This would have been a good case had the patient remained well. Unfortunately, she has had two further attacks of thrombosis, or of what seemed to be thrombosis, from the last of which she is only now recovering. The first of these kept her in bed less than ten days; and now she wants to get up before a week is out. But she persists in stating her backache is gone, though pain in the right thigh continues.

Believing, as I firmly do, in the benefits which by surgery we can confer on humanity, and especially in those mechanical measures by which backache can be successfully dealt with, the question at times arises when plastic procedures have been done and the patient gets well and the old pain goes, whether the wish had not something to do with the thought—whether ceremonials are not after all of value. In many cases there is no doubt; the change in structure effected, demonstrable to one's senses, explains the altered outlook of the patient. It is true that the abdominal wall in this patient of mine had become greatly improved; in spite of that, and if she previously had backache (as I believe), I can only describe its relief by surgery as magical.

ANATOMICAL ABNORMALITIES.

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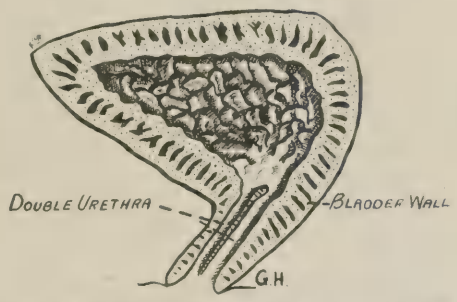
DURING the spring term of 1923 a remarkable series of abnormalities came under my observation at the anatomy department of the King Edward VII. Medical College, Singapore. The subjects for dissection are drawn from the coolie class of Chinese, with occasionally a Tamil coolie. Female subjects are very difficult to obtain, as there is a minority of women of all nationalities in Singapore.

CASE 1.—The most noteworthy abnormality, one which I have not seen previously reported, occurred in a female Tamil subject. On making the usual median incision through the pelvic viscera the knife divided the urethra in its entire length, displaying a double channel with double opening into the bladder, and a single external urethral orifice. The urethra was divided by a very thin septum (Fig. 1), having a uniform thickness of 1 mm. in its entire

FIG. 1.



Case 1.—Double urethra, divided by a thin septum (width 1 mm.) along almost its entire length.

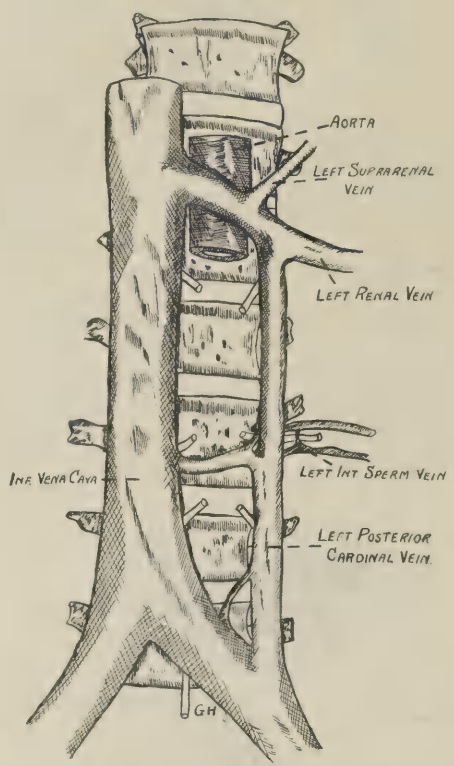
length except near the internal urethral orifice, where it was slightly enlarged and measured 3 mm. The condition at first sight appeared artificially produced, but scrapings were taken from each canal and examined under the microscope. Both canals were found to be lined by squamous epithelium. The internal urethral orifice of each canal was depressed, and the mucous membrane formed a ridge round each opening.

CASE 2.—In an adult male Chinese a persistent left posterior cardinal vein was found (Fig. 2). The vein extended between the left common iliac vein and the left renal vein, and measured 8 mm. in diameter. The vessel lay along the left antero-lateral border of the vertebral column, and received the lower three lumbar and internal spermatic veins of the left side. The corresponding lumbar arteries passed posterior to the cardinal vein. The upper extremity of the vessel opened into the left renal, 3½ cm. from the medial border of the left kidney. At the lower end a small communicating vessel passed between the posterior cardinal and the left common iliac. The left internal spermatic opened into the left border of the left posterior cardinal near its middle, and at the same level a small communicating vessel passed to the inferior vena cava.

From its position, relations, and tributaries the vessel is obviously a persistence of the lower part of the posterior cardinal of the embryo.

CASE 3.—In this subject my attention was drawn to the remarkably small calibre of the ascending colon and the absence of cæcum and appendix. On examination, however, I found that the cæcum occupied the position of the normal hepatic flexure. The cæcum lay in a horizontal position with its apex directed to the right. The appendix was turned upwards and to the left behind the cæcum. The position of the ascending colon was occupied by the terminal portion of the ileum, which had no mesentery, but had the same peritoneal relations as the normal ascending colon. There was a large retrocæcal pouch. This condition represents a failure in descent of the cæcum to the right iliac fossa after the rotation of the gut from the left iliac fossa to the right hypochondrium. In a similar case which came under my notice some years ago an inflammatory condition in the right hypochondrium, diagnosed as hepatic abscess, proved to be appendicitis.

FIG. 2.

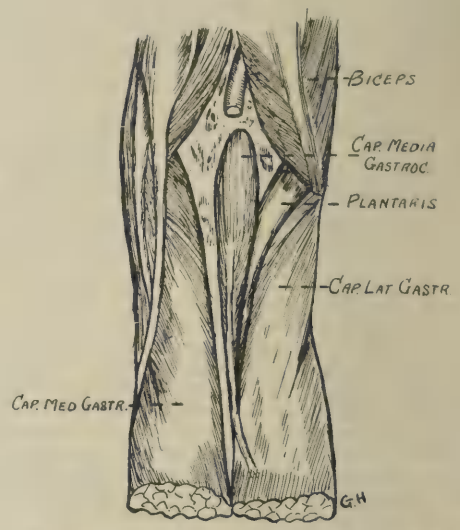


Case 2.—Persistent left posterior cardinal vein (diameter 8 mm.) extending between left common iliac and left renal veins.

CASE 4.—Another subject, also Chinese, provided an abnormality in the musculature of the popliteal region. This took the form of a small muscular belly which might be called the middle head of the gastrocnemius. It took origin from the middle of the planum popliteum of the femur by fleshy fibres forming a fusiform belly (Fig. 3). The muscle fibres converged to a thin rounded tendon, which had its insertion into the medial margin of the lateral head of the gastrocnemius near its junction with the medial head. The tendon lay on the lateral side of the popliteal vessels and posterior tibial nerve. The muscle closely resembles the gastrocnemius tertius of Krause and the popliteus minor, the latter, however, gaining insertion into the posterior ligament of the knee-joint. The nerve supply was derived from the posterior tibial nerve. The condition was bilateral (Fig. 4). It is possible that some such muscle as this is the morphological equivalent of the palmaris longus of the hand.

CASE 5.—This abnormality introduces a controversial element. While demonstrating at Glasgow University I had a remarkably good specimen of the sternalis muscle, which occurred in a male specimen, aged 60, in whom the muscular system was well developed (Fig. 5). The muscle was bilateral and placed ventral to the pectoralis major. It took origin from the costal cartilages of the fourth to the seventh ribs and the adjacent half of the anterior surface of the sternum, a few of the fibres being in direct continuity with the fibres of the rectus abdominis. The muscular belly ended above in a stout tendon directly continuous

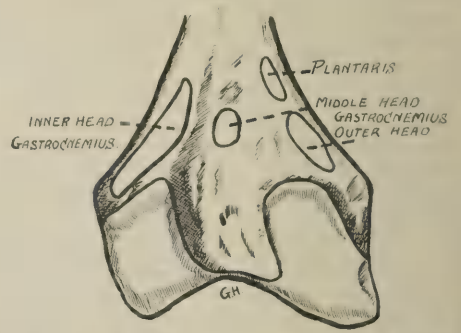
FIG. 3.



Case 4.—A small muscular belly or "middle head" of the gastrocnemius took origin from the middle of the planum popliteum of the femur in both legs.

with the sternal tendon of the sterno-mastoid, while a thin lateral expansion was attached to the medial end of the anterior surface of the clavicle. The right sternalis measured 4 cm. in breadth and 1 cm. in thickness, the left measuring 3·5 and 0·8 cm. respectively. The measurements were taken in the preserved condition. Unfortunately the nerve supply of the muscle was not definitely ascertained, although the muscle was pierced by the anterior terminal branches of the second to the sixth intercostal nerves. Since then I have observed four bilateral and three unilateral specimens at Glasgow, but in every case except one—the specimens being dissecting-room subjects—the possibility of a nerve supply from the external anterior thoracic nerve could not be excluded. In the exceptional case the muscle was observed early, and Dr. John Morton, lately demonstrator at Glasgow University, made an extremely neat and careful dissection. The specimen in this case was poorly developed, but there was no nerve supply from the external anterior

FIG. 4.



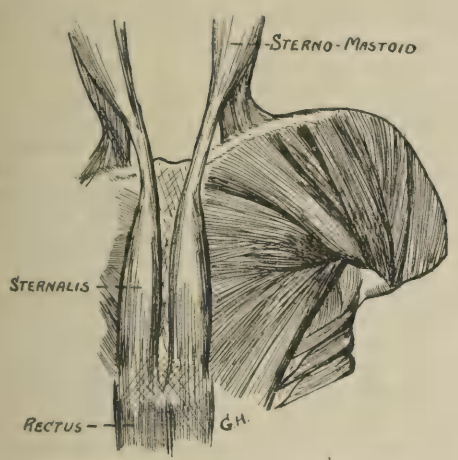
Case 4.—Lower end of the femur, showing precise site of origin of the "middle head" of the gastrocnemius.

thoracic. A twig from the terminal branch of the second intercostal nerve was traced for a distance of 1 cm. into the substance of the muscle, giving off numerous slender filaments.

Recently I have seen two bilateral and three unilateral specimens of the sternalis in the dissecting room at Singapore. In two cases the nerve supply was not definitely ascertained. In one, where the muscle was very poorly developed, the muscle fibres

ended in a thin aponeurosis, which passed laterally to blend with the fascia covering the pectoralis major, a few tendinous fibres crossing the middle line to blend with the aponeurosis of its fellow. In this case the muscle had a fine twig from the external anterior thoracic nerve. In the other two cases in which the muscle was observed early enough to permit of careful dissection for the nerve supply, the muscles were more definitely vertical in direction, and in each case they were continuous with the sterno-mastoid. In one specimen the third intercostal nerve before piercing the muscle gave off a fine twig which ended in minute ramifications in the substance of the muscle. In the other case the second and third intercostal nerves gave off similar twigs, which

FIG. 5.



Case 5.—Bilateral sternalis muscle in a male, placed ventral to the pectoralis major, taking origin from costal cartilages of fourth to seventh ribs and adjacent half of anterior surface of sternum. A few fibres were in direct continuity with fibres of the rectus abdominis; above the muscular tendon was directly continuous with the fibres of the sterno-mastoid.

ended in the substance of the muscle. Neither specimen had a nerve supply from any other source. The specimen figured in the diagram was the largest I have seen.

Considerable difference of opinion exists regarding the morphological significance of the sternalis muscle, and volumes have been written concerning it. To state the matter briefly, one authority holds that the sternalis is derived from the pectoralis major and shares its nerve supply. Indeed, when the muscle is present there is frequently a deficiency in the pectoral muscle. Others consider that it is part of the pubo-hyoid system, and therefore supplied by the intercostal nerves. In support of this theory is the fact in some animals the rectus abdominis extends to the first costal arch. I have seen the rectus extend as far up as the third costal cartilage in the human subject. Another authority considers it a part of the panniculus carnosus.

It is more than five years since I first directed my attention to the sternalis muscle, and I have seen most of the literature on the subject. From the specimens which have come under my notice it appears to me that there are two separate and distinct varieties of abnormality in this region. One variety, the sternalis proper, is supplied by the intercostal nerves and is morphologically continuous with the rectus abdominis. The other variety is developed from the pectoralis major and has a similar nerve supply to that muscle. This variety I propose should be called the sterno-pectoralis. Its nerve supply is a long slender twig from the external anterior thoracic nerve which pierces the pectoralis major to enter the deep surface of the abnormal muscle. It is a remarkable fact that this variety is present in 50 per cent. of anencephalic fœtuses.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OTOLOGY.

A MEETING of this section was held on Feb. 2nd, when the chair was occupied by Mr. SYDNEY SCOTT, President of the section.

SURGERY OF SUPPURATIVE AND CERTAIN NON-SUPPURATIVE AFFECTIONS OF THE LABYRINTH.

Sir WILLIAM MILLIGAN (Manchester) read a paper on this subject. He said the clinical picture presented by disease of the labyrinth varied with the segment of the internal ear involved—whether the static or the dynamic segment, or a combination of both. Disease of one segment did not necessarily mean involvement of the other too, therefore any surgical measure should be designed to cause the least interference with the non-infected or only partially affected area. When the cochlear segment was involved there was nerve deafness and persistent tinnitus; when the disease was in the vestibulo-canalicular system the patient had vertigo, disturbances of equilibrium, nystagmus, nausea, or even sickness. Purulent discharge of internal ear might result from the spread of a septic process from the base of the brain via the internal auditory meatus and the sheaths of auditory or facial nerve. Or extradural or subdural abscess might cause the eminentia arcuata to become eroded and afford an entrance for organisms into the superior semi-circular canal, and thus the infection might become diffuse. But the most frequent route was by way of the middle ear following erosion of a portion of its inner wall or capsule of the labyrinth. This he considered resulted mostly from chronic infective disease of the middle ear. When labyrinthitis was due to acute purulent otitis media it was practically always an induced serous labyrinthitis. In circumscribed labyrinthitis, he contended, the most frequent portal was an erosion of the external semi-circular canal. The diffuse form originated in the fenestra ovalis. In cases of tuberculous otitis media in which the disease had subsequently spread to the internal ear, the pars promontoria was frequently destroyed and so opened up a wide invasion portal. The organismal invasion, he thought, was a question of defective drainage, due to a number of causes.

Clinical Types of Labyrinthitis.

The types of labyrinthitis met with clinically were three: circumscribed, diffuse purulent, diffuse serous. A mere erosion of the lateral canal did not justify the diagnosis of circumscribed labyrinthitis, as the erosion might be quite superficial. Such an erosion should be left alone, reliance being placed on the drainage secured by some form of post-aural operation. Circumscribed labyrinthitis, though a real pathological entity, was almost undiagnosable clinically, the symptoms might mean the presence merely of serous œdema, the result of a septic focus in the vicinity. If there was more than an erosion—i.e., a fistula—what should the treatment be? The consensus of opinion was that it should be left alone. The differentiation clinically between the "open door" and the "protected territory" at present defied solution. The case was different in diffuse purulent labyrinthitis, with its profound loss of hearing, nystagmus, nausea, high temperature, &c.; this called for prompt and efficient surgery, as it was a dangerous condition owing to the likelihood of the infection reaching the base of the brain and setting up meningitis. Also, unless free drainage was carried out the function of the auditory nerve would be abolished.

In operating, Sir William Milligan's aim was to secure efficient drainage and yet conserve some functional activity. Wherever possible he left the cochlear segment alone as much as he could, freely

ablating the static segment, removing the pars promontoria, and leaving the columella alone. But if the hearing was destroyed in a case of severe infection, the freer the drainage the better. When a complete labyrinthectomy was required he preferred the "bridge" operation; the results in his hands were surprisingly good, the technical bugbear being the Fallopian aqueduct with its contained facial nerve. But with strong illumination and meticulous precision the nerve should escape injury. In 54 cases on which he had operated, any injury he might have done to the nerve had been permanent in none.

Non-suppurative Labyrinthitis.

The surgery of non-suppurative labyrinthitis constituted a more debatable and difficult problem. What, he asked, was the pathology of the pseudo-Ménière syndrome? Were these cases due to effusion into the internal ear, to atheromatous changes in the terminal blood-vessels of the part, or to a toxic neuritis? The cases were mostly met with among people who had mental strain and worry, and were characterised by attacks of severe vertigo, sickness, tinnitus, and progressive loss of hearing. Some had high, some low blood pressure, some had granular kidney, and others some digestive disturbance. But some otherwise healthy people were subject to sudden and violent attacks of vertigo, with sickness, tinnitus, and loss of hearing at irregular intervals. Sometimes depressants, such as bromides, gave relief, but the depression and incapacity required more heroic measures, and for years he had advised and carried out a partial or complete destruction of the labyrinth. He had performed it for this class of case 20 times without a fatality, with relief to the vertigo in all, but with disappearance of the tinnitus in only 40 per cent., though in half (20 per cent.) the noises were much relieved. The 40 per cent. of cases were probably central in origin. In opening up the canalicular system he saw no evidence of increased labyrinthine tension, and the structures appeared normal. He could say nothing on the pathology, as he had not seen a post-mortem specimen. He concluded that it was really a toxic neuritis, affecting at first the nerve proper, but later extending to the maculæ acousticæ, where it set up a vicious circle of static incoördination, oculo-motor, and gastric disturbance.

In conclusion, Sir William Milligan narrated some typical cases in which operation had been completely successful. Operation was only carried out after medical treatment had been persisted in for a period of from one to three years. He showed a number of slides illustrative of his thesis, some of which Mr. J. S. Fraser kindly sent him.

Discussion.

The PRESIDENT said Sir William Milligan was looked upon by his colleagues as a pioneer in labyrinthine surgery. Mr. C. E. West was inspired to operate on the labyrinth 20 years ago by Jensen's work in Berlin. The cases in which Mr. West and he did the operation were mostly those in which disease was being followed to its source in the course of a radical mastoid operation. Errors might have been made by operating on patients who, because they were seized with vertigo, were assumed to have disease within the labyrinth. Most would agree that in some cases the labyrinth was needlessly destroyed. But there was a class of case in which the infection of the middle ear was so virulent that the organism gained entry into the internal ear. In a man aged 60, with symptoms of otitis media, on whom the speaker operated, death occurred in 11 hours, and the patient had already got meningitis. In deciding whether to operate or not, a careful clinical examination was of the utmost importance.

Sir CHARLES BALLANCE said all would agree that there were certain cases which should not be operated upon, but that was so in the evolution of every fresh operation; and the operation had been done because the surgeon felt it to be his duty to carry it out. The operation described by Sir William Milligan should certainly be done in suppurative labyrinthitis. Failing the establishment of free drainage, the patient would certainly die. He (Sir Charles Ballance) thought the most important factor was to have a very free area of bone exposed behind the facial canal. He saw Jensen operate on labyrinth cases in Berlin in 1900 and 1901; he was an able operator, but so quick that onlookers felt trepidation as to possible unintentional injury. The speaker considered that this region should be operated upon with extreme care and deliberation; no disaster need then be feared. With regard to the other group of cases, the non-suppurative, he agreed that the condition seemed to be a toxic neuritis, and that there was, in the majority of the instances, no obvious change in the internal ear. In the cases narrated by Sir William Milligan the operation was not only justifiable, but urgent. In some patients the nerve could be divided behind the internal auditory foramen. It was easy to expose the cerebellum and press it back by means of dry, sterilised marine sponges, as used by Sir David Ferrier. In suppurative disease it was not always necessary to take away the capsule of the cochlea.

Dr. ALBERT A. GRAY (Glasgow) commented on the rarity of non-suppurative cases in children under 12 years of age. In Ménière's disease he thought the symptoms were due not so much to high or low inter-labyrinthine pressure as to a sudden change from one to the other; that was probably why it occurred in people who were overworked. He agreed that a number of cases might be toxic.

Dr. P. WATSON-WILLIAMS spoke of the necessity of excluding sinus disease.

Mr. MUSGRAVE WOODMAN agreed that simple conditions should be eliminated before operative treatment was entertained. He narrated a case in which a man said he was incapacitated by attacks of vertigo and tinnitus. He was found to have a tight block in his Eustachian tube. A fine bougie was tightly gripped at the isthmus. On repeating this a month later, the bougie passed fairly freely, and since then the attacks of giddiness had ceased. But there were some cases of non-suppurative labyrinthine trouble on which operation should be done. He related a case of the kind in which he performed free drainage, and the patient, a nurse, was able to resume her occupation.

Mr. E. D. DAVIS related a case in which a patient with violent nystagmus lasting 12 months had lumbar puncture performed and got well after it. She was very highly strung. A widow who was working very hard and experiencing much anxiety had violent vertigo, sickness, and nystagmus, with loss of confidence. The passage of an Eustachian bougie cured these symptoms. There seemed to have been bad results from division of the auditory nerve in the hands of several surgeons, due to severe hæmorrhage.

Mr. G. J. JENKINS agreed that many cases were diagnosed as disease of the labyrinth when there was only a middle-ear affection. Two children with very pronounced labyrinthine symptoms were cured by the removal of enlarged tonsils and adenoids. Owing to the lack of a specimen from a non-suppurative case, it was difficult to obtain a clear idea of the pathology of pseudo-Ménière's disease.

Mr. L. COLLEDGE said the chief question in a desperate case was as to what operation should be done. There was a likelihood that an increase of intracranial pressure might lead to symptoms. In some cases it was simpler and safer to do a cerebellar decompression operation than to open the labyrinth.

Dr. W. S. SYME said he always put the nasal condition of patients with these symptoms right before considering the question of operation. In only two non-suppurative cases had he opened the labyrinth. In acute cases he approached the question of operation warily.

Reply.

Sir WILLIAM MILLIGAN, in reply, said he also saw Jensen operate in Berlin, and he agreed with Sir Charles Ballance that he did his operations in this confined region far too rapidly. When the anæsthe-

tist pointed out to the operator that the facial nerve was twitching, the sharp reply was, "It does not matter." The facial nerve was paralysed before the patient left the table. He did not agree with Sir Charles Ballance that the cases were more easily approached through the posterior fossa. He had never found that lumbar puncture brought any permanent relief to the cases he had described. Years ago he tried decompression of the posterior fossa, but had now given it up. He emphasised the point that operation was not done by him until a very careful attempt had been made to exclude other conditions, and until medical treatment had been given a good trial.

A number of instructive cases shown by members were discussed.

Reviews and Notices of Books.

SYNOPSIS OF MIDWIFERY.

By A. C. MAGIAN, M.D., Gynæcologist to the Manchester French Hospital. London: William Heinemann (Medical Books), Ltd. 1923. Pp. 245. 8s. 6d.

THERE must be many practitioners so fully occupied that they have not leisure to read ponderous text-books on obstetrics, and yet are anxious to keep abreast with current thought and teaching. To such and to the senior student who wishes to refresh his memory before the examination ordeal, we can with confidence recommend Dr. Magian's little volume. As the title suggests, the book is a synopsis of the leading facts and principles of treatment, and in its compilation the author has freely consulted the writings of most British authorities on the subject. In the space of 245 small pages Dr. Magian has managed to compress a wonderful amount of material. The style, although somewhat didactic, is not abrupt, and each of the 31 chapters contains sound teaching.

We recognise many well-known precepts, and with most of the teaching we are in complete accord. There is very little debatable material, and such as is present must be attributed to the works consulted rather than the author. Progress moves apace, and for this reason it is difficult for any book which relies for its information upon its predecessors to be absolutely up to date. For example, there is no reference to Eardley Holland's recent work on the causes of stillbirth, or again in the chapter on anæsthesia to the advantage of spinal anæsthesia in Cæsarean section and in labour complicated by mitral disease. Eclampsia and its treatment, on the other hand, is well discussed, and the chapter on Forceps is particularly good. It contains what is necessary without any undue padding, and if the advice given is acted upon, the practitioner can be satisfied that he is acting up to ideals.

The book, like other synopses, is not intended to replace or add to the number of standard obstetric text-books, and is not suitable for the junior student. The senior man, however, will find it a very useful "refresher" and can be assured that the information he finds within its pages is sound.

PREVENTION OF DENTAL CARIES AND ORAL SEPSIS.

Third edition. By H. P. PICKERILL, C.B.E., M.D., Professor of Dentistry, and Dean of the Dental School, University of Otago. London: Baillière, Tindall and Cox. 1923. Pp. 340. 18s.

WHEN the first edition of this book appeared in 1911 it was generally recognised that Prof. Pickerill had made a notable addition to dental literature. It displayed original research and a determination to take nothing for granted. Instead of publishing various researches as they were completed in different journals, he withheld them until their appearance in this book. Thus the world of dentistry, not being in any way familiarised with the nature of his investigations, was the more prepared to be impressed by the amount and quality of original research embodied therein.

In form and matter this edition does not differ materially from the first, though both additions and emendations have been made. One feels that there is a certain risk in publishing successive editions of a book which is a record of personal research; the title-page may be dated 1923, but the work itself dates from 1911, and has lost some of its freshness. Prof. Pickerill's work has not passed unchallenged, but we do not find any serious consideration of investigations which have appeared since this book was first published. F. P. Chillingworth, for instance, has attacked both the chemical methods used by Pickerill in his investigation of salivary secretion, and his conclusions that it varies according to the food. This work appeared in 1922, and gives several references to earlier work directly dealing with Pickerill's results. The fact that the author does not take into account the work of Chillingworth and others rather lessens the value of his conclusions from the point of view that they still hold good without modification 13 years after their first publication. The section on the bacteriology of the mouth does not seem to go beyond the work of K. Goadby. In 1911 this was inevitable, but to-day we are in possession of the work done by P. Howe in 1917, and the still more important investigation of McIntosh, James, and Barlow in 1922, both of which make Pickerill's conclusions on this subject of less account. But many of the researches have been generally accepted and confirmed by other workers, that on enamel, for instance, has added another chapter to our knowledge of this complicated tissue. It would have been difficult perhaps to have added anything to this section of the book, so sound in plan and execution.

It is an encouraging sign that a book like this, which is not an ordinary text-book, but is crammed full of original work requiring close reading, should reach a third edition. Even if it has lost its first youth, it still remains a stimulating and suggestive piece of work. Its influence on dental thought, both in this country and abroad, has been considerable, and dental science is a debtor to Prof. Pickerill.

COLLOIDS.

Manuel de techniques de physico-chimie et spécialement de chimie des colloïdes; à l'usage des médecins et des biologistes. By LEONOR MICHAELIS. French translation by H. CHABANIER et C. LOBO-ONELL. Paris: Masson et Cie. 1923. Pp. 204. Fr.12.

WE have reviewed the second German edition of this work, of which this is an excellent translation into French. All that we said of the German original was to its credit, and applies equally well to the present translation, which will be welcomed by those who are less familiar with German than with French. A large sale for this volume can be predicted.

A MANUAL OF PSYCHOTHERAPY.

By HENRY YELLOWLEES, M.D., F.R.F.P.S. Glasg., M.R.C.P. Edin., Medical Superintendent, The Retreat, York. London: A. and C. Black. 1923. Pp. 247.

DR. YELLOWLEES belongs to no particular school and gives an impartial account of current psycho-pathological theories. He accepts the psycho-analytical ætiology, but regards persuasion and suggestion, in which he includes the formal use of hypnotism, as of more immediate value than analysis. Hypnotism, however, he prefers to use as a means of aiding the return of lost memories, the process of integration thus carried out accomplishing more than the mere removal of symptoms by suggestion under hypnosis. The chapters on dream analysis and psycho-analysis briefly outline the subject, but are not intended as sufficient guides to their practice. Those on psycho-therapy in general practice point out the need for an

understanding of the unconscious processes described in previous chapters and contain sound advice on elementary and important points.

Concerning "nervousness" Dr. Yellowlees writes as follows: "With a little understanding and assistance, most patients who use this word will reveal themselves as cases of obsessional neurosis, or of some anxiety state, although it may be hard to put a diagnostic label upon such a case until after the patient's confidence has been fully gained in several interviews." The application of this teaching, simple as it appears, will reveal a wealth of clinical material that should tempt the practitioner into further study. As a guide to the objects of this study Dr. Yellowlees's admirable book affords a useful and practical introduction.

ZOOLOGY.

Outlines of Medical Zoology. By R. W. HEGNER, W. W. CORT, and F. M. ROOT. London and New York: Macmillan Company. 1923. Pp. 175.

THIS rather slender handbook of Medical Zoology has grown out of a publication which appeared in 1921, entitled "Diagnosis of Worms Parasitic in Man." It is naturally fuller than its progenitor and therefore to that extent more useful. But it is not a treatise upon the general zoology of parasites; it is a list of those known in man with sufficient diagnoses to aid public health officers, students, and physicians. For such readers it should prove a convenient epitome of much that it is necessary to determine in identifying a parasite. Identification is also rendered much more easy by a few plates illustrative of protozoan parasites, such as malaria, and of salient anatomical characters of eggs of worms and various parts of insects and mites. In connexion with their association with or merely as carriers of certain diseases the authors explain many of the methods in use for collection or preparation of protozoa, worms, and arthropods, which form the parasitic groups dealt with. All this information is undoubtedly strengthened by a reasonable list of books by different authorities, and a selection of journals which deal with parasitological matters. The usefulness of this handbook is enhanced by a fairly full index, in which references to pages on which a figure occurs are printed in heavy type, and names of investigators as well as animals are to be found.

A Manual of Elementary Zoology. Fourth edition. By L. A. BORRADAILE, Sc.D., Fellow and Tutor of Selwyn College, Cambridge. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 671. 18*s*.

Elementary Zoology for Medical Students. By L. A. BORRADAILE, Sc.D. Same publishers. 1923. Pp. 378. 10*s*. 6*d*.

THESE two volumes are hardly two separate works; for the smaller, which is intended only for the student of medicine, is practically an abbreviation of the larger volume from which the bulk of its pages are drawn. It has, however, a new introductory chapter. The Manual has now reached its fourth edition, having been originally published in 1912, and the author is to be congratulated upon its long life. The addition of two new chapters upon the sponges and echinoderms respectively may be noted, and a revision of statements and slight alterations in respect of mammalian embryology and the physical properties of protoplasm are to be found. A statement of this kind is made in the author's preface, and shows how fixed and almost axiomatic the general body of facts dealt with in an elementary text-book tends to become. The types of animals selected for detailed study are so well-known that it is almost difficult to fall into error. Furthermore, the continued and widely spread study of zoology throughout the world has brought before us a vast amount of facts relating to other animals than those commonly selected as types, and this has been confirmed again and again, and now constitutes a reliable collection of information. To such accumulations or conversant authorities any writer of a text-book to-day should apply for assistance or confirmation. Thus, the author, himself best known as a student of certain crustaceans, quotes the names of others who are well known in other regions of zoology.

AIDS TO PHYSIOLOGY.

Second edition. By JOHN TAIT, M.D., D.Sc., late Lecturer in Experimental Physiology, Edinburgh University; and R. A. KRAUSE, M.D., D.Sc., late Lecturer in Hygiene and Physiology, College of Hygiene and Physical Education, Dunfermline. London: Baillière, Tindall and Cox. 1924. Pp. 255. 3*s*. 6*d*.

IT must not for a moment be supposed that the authors intend this small work to be used by students as a text-book of physiology; it is not a text-book, and can never be regarded as one. Whether such small and compressed books are of any real value is a thing best decided by students themselves. Judging from their sale, it would seem that they have a certain field of usefulness, and in so far as small books of this description are used by students for purposes of revision only, there is nothing to be said against them. This present volume is excellent in its way, is accurate and up to date, and puts the subjects in the smallest possible space. We should only object to it, and then most violently, if students were to attempt to learn all their physiology from it, for such efforts would be attended with certain failure. This little volume, like its similars, should prove valuable in those trying weeks which immediately precede an examination.

JOURNALS.

QUARTERLY JOURNAL OF MEDICINE.—The January number contains the following articles: Acute Myelocythæmia and Chloroma, by Alexander Goodall and W. A. Alexander. Four cases of acute myelocythæmia are recorded, the first being a typical example of the disease and the last of chloroma, whereas the third shows features which are intermediate between the two conditions. Less than 100 cases of chloroma have been published to date, and the third of the series here recorded, representing the intermediary stage, is regarded as unique. The disease had a rapid course in every instance, varying from two weeks to three and a half months. The total white cell count was relatively low, and the spleen was not greatly enlarged. The opinion is expressed that leukæmia is the result of infection, and that the process is of the nature of a tumour growth. The article is illustrated by two plates, showing the macroscopical and microscopical appearances.—An Investigation into the Pathogenesis of Disseminated Sclerosis, by D. K. Adams, J. W. S. Blacklock, E. M. Dunlop, and W. H. Scott. A clinical description of the early symptoms is first given. Examination of the cerebro-spinal fluid shows that whereas the Wassermann reaction is negative in disseminated sclerosis the colloidal gold test gives a positive reaction. It has been disputed whether it is possible to produce nervous disease in rabbits by the injection of the cerebro-spinal fluid obtained from patients suffering from disseminated sclerosis. The authors inoculated 16 rabbits with cerebro-spinal fluid obtained from nine patients, and produced nervous symptoms in five of the rabbits, with fluid from five of the nine patients. Injection of citrated blood from eight patients produced nervous symptoms in three instances. Emulsions of the central nervous systems of rabbits showing nervous symptoms produced, on inoculation into other rabbits, nervous symptoms in two of the 11 tested. In all over one-third of the rabbits inoculated developed nervous symptoms, whereas control rabbits inoculated with blood and cerebro-spinal fluid from normal individuals and those

suffering from other diseases showed no effect. Spirochætes were found in some of the inoculated animals. Early diagnosis and treatment with the salvarsan group of drugs is recommended. Two plates are included, illustrating the nervous symptoms produced in the rabbits, and the microscopical appearances of the organs of the infected animals.—Diastase Determination in Urine and Blood as a Method for the Measurement of the Functional Capacity of the Kidney, by D. D. Stafford and T. Addis. The authors first describe their methods for estimating the amount of diastase in the blood and urine. An investigation was carried out on a series of cases of Bright's disease. It was found that the concentration of diastase in the plasma and the urine, and the rate of diastase excretion did not afford any indication of the extent of the renal lesion, as judged by the rate of urea excretion and the urea concentration in the blood.—The Adenoid Child: A Histological and Clinical Study, by Lucy Wills and Joan Warwick. As the result of a clinical and histological study of adenoid children, the authors conclude that a relationship exists between the type of adenoid enlargement and the configuration of the child. In inflammatory adenoid lesions the figure and bodily posture is normal, whereas in adenoid hypertrophy there is muscular hypotonus with marked lordosis and a pendulous abdomen. Chest deformities are found in both groups, they are probably due to rickets. A correct diagnosis of the histological character of the adenoid enlargement was made on postural grounds in between 83 and 88 per cent. of cases. Plates illustrating the configuration of the children and the histological appearances of the adenoids are included.—Arthropathia Psoriatica, by Archibald Garrod and Geoffrey Evans. The association of joint lesions with psoriasis has been described by many authors. Three cases are here recorded, in two of which a peculiar condition of intermittent hydrarthrosis occurred. Menstrual irregularity was also a prominent feature.—The Operation of Cardiolysis, with a Description of Two Fresh Cases and an Analysis of the Literature, by Geoffrey Bourne. This article opens with an account of the physical signs and mechanics of adherent pericardium. The indications for cardiolysis are then described, the chief of which is heart failure with pericardial adhesions, the contraindication being a severe progressive rheumatic lesion. Two cases operated upon by Mr. Joseph Adams are described, in both of which there ensued a considerable degree of amelioration of symptoms. The article concludes with an abstract of 23 cases from the literature.—Experiments on the Ætiology of Chronic Infection of the Spleen, by Alexander George Gibson. In a previous communication to the *Quarterly Journal* (1914, vii., 153) the author detailed some observations on cases of splenomegaly of obscure origin, in which it was suggested that infection with a streptothrix might be the ætiological factor. Further experiments have now been performed with a streptothrix isolated from the spleen of a patient who had suffered from recurrent acholuric jaundice. Ten monkeys were inoculated, and all showed symptoms of disease. From three of the animals the streptothrix was recovered and grown in pure culture. It is therefore claimed that Koch's postulates have been complied with, although it does not appear clear that the inoculated monkeys suffered from the same disease, as the patient from whose spleen the streptothrix was isolated, for in only one monkey was the spleen enlarged, and in none was the fragility of the red cells increased.—Critical Review: Sepsis as a Cause of Lymphocytosis, by H. Letheby Tidy. Sixteen cases of lymphocytosis possibly associated with sepsis have been collected from the literature published from 1907 onwards. An analysis of these is given, as a result of which the author concludes that there is no evidence that sepsis produces lymphocytosis.—The journal concludes with an account of the proceedings of the annual general meeting of the Association of Physicians of Great Britain and Ireland held at Edinburgh in 1923.

JOURNAL OF INDUSTRIAL HYGIENE. November, 1923.—The effect upon output of alternating occupations is discussed by J. M. Baumberger. He presents a study of output hour by hour in the processes of glass gathering, the spin-top lathe operation, and recessing gears. In the first, work is only carried on for a short time and then is alternated for another process, in the last two the operation is continuous through the shift. The author finds that a closer approach to maximum working capacity occurs when occupation is alternated, and suggests that in this way increased output might be obtained in many industries.—C. K. Drinker contributes an article on the present status of resuscitation in cases of electric shock and of carbon monoxide poisoning. He finally concludes that the Schäfer method of resuscitation is at once the simplest and most effective method, and decides against any specially constructed apparatus, except in unusual circumstances. For this reason he does not favour the oxygen-carbon-dioxide method.—E. L. Collis writes a statistical article dealing with the general and occupational prevalence of bronchitis, in which he discusses its relation to phthisis and to pneumonia. He finds that the mortality from bronchitis has been falling even more rapidly than that from phthisis, while in contra-distinction the mortality of pneumonia has been rising. Climatic conditions and atmospheric pollution are considered to be the main causative influences affecting bronchitis, while no evidence is found that it spreads as does phthisis through infection. Bronchitis is held to be a disease of chronic traumatic origin associated with irritating atmospheric conditions.——The number dated December, 1923, contains an address by C. E. Ford, President of the American Association of Physicians and Surgeons, which contains matter of some interest. He points to the strategic position occupied by the industrial physician with regard to many public health problems, and places within his purview such things as infant welfare and pre-natal care as being subjects inextricably bound to the industrial future of the nation. He holds that merely by applying present knowledge the average length of life could be readily extended to 65 years, and shows how low wages result in high rates through increased sickness. The author gives definite statistics to support his case.—J. N. Basin deals with the prevalence of medico-legal aspects of sprained back, a common condition seldom treated scientifically. The author holds that in each case there is a solution of tissue continuity by tearing soft tissues, joint luxation, and occasional sprain fracture in the lower spinal region. He strongly advocates a pelvic girdle support to prevent "labour back" for all manual workers. Accurate diagnosis and early treatment are held to be necessary to economic recovery.—L. R. Thompson and D. R. Brundage discuss the way in which sick benefit associations may profitably engage in the work of preventing disease. These associations possess information as to the extent and locality of sickness, which may vary from 151 cases per 1000 in one industrial plant to 62 cases in another. Only by following up such statistical information can the cause of undue sickness be accurately diagnosed. The authors put forward an unanswerable case for the need for morbidity statistics.

LEAGUE OF NATIONS HEALTH ORGANISATION.—We have received four pamphlets, prepared for the Society of Medical Officers of Health in connexion with the visits of foreign public health officers arranged by the Health Organisation of the League as part of a scheme for interchange of public health personnel, financed by the Rockefeller Foundation. The first pamphlet contains Notes on Public Health Organisation in England, by Dr. Charles Porter. The other three, by senior officers of the Ministry of Health, are entitled "English Port Sanitary Administration," by Dr. R. J. Reece; "Administrative Control of the Purity of Food in England," by Dr. A. W. J. MacFadden; and "Anti-Tuberculosis Measures in England," by Dr. F. J. H. Coutts. These pamphlets illustrate medical intelligence and propaganda which is very appropriate to a Government office, and represent the sort of handy up-to-date information which the Ministry of Health itself might usefully publish for home consumption.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

VI.—ACTIONS FOR DAMAGES: ERRORS OF DIAGNOSIS.

BY HUGH WOODS, M.D., D.P.H.,
GENERAL SECRETARY, LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.

Beware
Of entrance to a quarrel; but ....
—*Hamlet*, Act I. Sc. 3.

ACTIONS for damages are rarely brought against medical practitioners in respect of alleged deliberate wrongdoing. Damages are claimed in the great majority of cases on the ground of negligence, or want of skill, or both. Want of skill is not often put forward as the main ground for claiming damages. To substantiate such a claim it must be proved that the skill exhibited was below that which any ordinary individual of the practitioner's standing in his profession would be reasonably expected to possess. A jury is not readily inclined to believe that a properly qualified doctor has not the average skill that all doctors are assumed to possess. If he has caused damage to his patient they are much more ready to believe that, while he had skill enough to avoid it, he did not take the trouble requisite for this purpose. The defence against a claim for damages consequently depends almost always on the evidence available in disproof of charges of negligence on the part of the doctor. Treatment, whether medical or surgical, is often unsuccessful. Patients die, or get worse instead of better, and the medical attendant may be blamed. In fact, with some people, it seems to afford them relief if they throw the blame for their misfortunes on someone else, and recent legislation, such as the Workmen's Compensation Act, appears to have created an impression that misfortunes or accidents should be alleviated by compensation at the expense of someone other than the sufferer under almost any circumstances.

Precautions Against Accusation of Negligence.

To obtain compensation from the medical attendant charges of negligence are readily trumped up, and they are often difficult to rebut. It is easy enough after the event to find fault with what has been done, and to contend that things which were left undone would have had far better results. Almost any line of treatment is open to criticism, and medical evidence is too often available in support of criticism more or less captious or unfair. Hence it becomes a matter of ordinary prudence for doctors to adopt precautions against accusations of negligence in their treatment of patients. Preventive precautions are, of course, best, but these will frequently fail, and it is therefore necessary to be prepared to defend oneself successfully when attacked. It is a mistake to suppose that the most careful practitioner will be immune to attacks founded on allegations of negligence. Claims for alleged negligence, put forward without any just foundation by dishonest or foolish claimants, may nevertheless be very difficult to meet satisfactorily. Conscientious care in all cases is a matter of duty as well as of prudence; but it is also advisable to avoid all appearance of carelessness and to remember that the adoption of routine precautions, the making of detailed examination, the employment of tests, and in general the outward indications of care, assume an importance quite beyond their due when a case goes into court. Especially important is the evidence of little details of the procedure adopted in arriving at a diagnosis when an error has been made, as will happen with the best of physicians or surgeons. A stupid mistake made in diagnosis after a punctilious observance of all the appropriate rules for arriving at an accurate diagnosis is much less likely to lead to legal disaster than the making of a mistake which could hardly or at all have been avoided, if any procedure recognised as advisable has been omitted, even though the practitioner has quite reasonably considered it unnecessary or useless.

X Ray and Bacteriological Examinations.

Consequently, in the case of injury of bones or joints, it will be a great advantage to the surgeon if an X ray examination has been made; and if such examination has been omitted and the exact nature of a fracture or dislocation has not been detected the omission will be described by plaintiff's counsel as gross neglect, and to it he will attribute any failure to attain a perfect result, even though it be a case in which permanent deformity was highly probable. Again, if a medical attendant has failed to detect a disease such as tuberculosis or diphtheria, it will be unhesitatingly assumed by plaintiff's counsel, and quite likely believed by the jury, that a bacteriological examination would have ensured an accurate diagnosis. It will be difficult, on the other hand, to prove that such an examination would not have been desirable or conclusive. A verdict of negligence, and an award of damages, is only too likely to result even though there be no reasonable grounds for the belief that a more precisely accurate knowledge of the conditions would have meant better treatment or a more satisfactory result.

Sharing the Responsibility.

It may seem, then, that it should be an absolute rule that such examinations should without exception be insisted on in the interests of the medical attendant quite apart from those of the patients. There are, however, in many cases serious difficulties in the way of adopting this as a fixed rule. Patients and their relatives often object to the cost, and ask if the doctor thinks such examination really necessary. Unfortunately, the fact that the doctor feels quite sure of his diagnosis, without special methods of examination, does not preclude the possibility of error, and the fact that any examination at all likely to be made will not alter the treatment does not make the doctor's position safe if an error is subsequently detected. In remote country places the difficulty in the way of an X ray examination is sometimes very serious, and it may be impossible to arrange for it without prohibitive expense or the risk of ill consequences from the conveyance of the patient to a place where such examination is practicable. In these instances the responsibility should be laid as far as possible on the patient or the responsible relatives. The desirability of the examination should be clearly explained and any danger or expense that will be involved should also be pointed out. This should be done either in writing or in the presence of trustworthy witnesses, so that in the event of a claim for damages it can be incontestably proved that the patient was fully informed and accepted responsibility. Otherwise, the medical attendant may find his truthful assertions positively denied, and it may be supposed that he is only inventing excuses to justify his own negligence.

In some cases, when the doctor is convinced that unnecessary risk of a bad result will be run if the examination he recommends is not carried out, it may be advisable to refuse to continue in charge if his advice is not followed, but, of course, if the extreme step of withdrawing from a case is decided upon, proper care should be taken that the patient shall not be exposed to any risks thereby.

ARUNDEL AND DISTRICT COTTAGE HOSPITAL.—A satisfactory financial situation was reported at the annual meeting of the governors on Jan. 31st. The receipts for 1923 totalled £1422, including £613 from subscriptions £292 from hospital fees, and £300 from the pageant committee. The latter had been invested, and the balance at the bank increased from £210 to £283. The net expenditure was £1033, and the net revenue, £1121 18*s.* 8*d.* It will be remembered that in 1917 the town took over the hospital from the Duchess of Norfolk, and the executive committee assumed financial control, with Sir William Bird as President.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 9, 1924.

HOUSING AND HEALTH.

THE first Minister of Health, Dr. ADDISON, was a medical man, and it was, we believe, with the approval of the Administration with which he was associated that he embarked upon a campaign for setting right our lamentable housing conditions, making it the reason and basis of his official life, and considering that such action was fundamental to the duties of his office. The fact is well-known, though its reasons are not correspondingly clear, that the great activities thus set in motion had to be suspended; Dr. ADDISON failed to obtain the support of his colleagues for his objectives, and thereafter housing questions have not taken so prominent a position in the programmes of succeeding Ministers of Health. Yet all medical men know that whoever presided over the Ministry must have been aware of the vital importance to the health of the nation which is implied in housing reform.

The new Minister of Health, Mr. JOHN WHEATLEY, has done well, therefore, in selecting the housing question as the subject for his first speech to his constituency upon his appointment, when he took the bold course of confessing that he was not in a position to say what the Government's policy is or would be. We say bold, for it is possible to be discreet and valorous simultaneously, and to require more courage to confess to the discretion than the valour. For medical men Mr. WHEATLEY'S acknowledgment that he was taking thought of the undoubted difficulties in his path before deciding how to meet them, implies a promise that he will face those difficulties by ascertaining their sources and estimating their importance. We hope that such is his intention, for then he may arrive at a course of therapeutics founded upon the origins of the evils rather than upon their symptomatology. He will, it seems to us, lay truly the foundations of an enormous task, if he can clear away from the public mind the many misunderstandings which impede all in whose hands the actual provision of adequate housing must lie, among whom the whole of the medical profession, and not only the branch of that profession officially attached to his bureau, must be included. Medical men, finding in bad housing conditions the origin or the fomenter of disease, feel helpless in their attempts towards remedy as long as it is idle for them to make representations for housing reform; and yet it is no reproach upon any public authority to confess itself unable to carry out such recommendations as are made. And these conditions will remain so long as political animus leads one school of thinkers to attribute the present inertia entirely to the intention of a certain class to exploit the interests of the nation for private profit, or another school of thinkers to see an alleged insistence by trade-unions upon monopolies as the sole source of the evil. The health of the people is not a political question but a national one, and, where the right course to be taken cuts across the political views of the Government or of any opposing party, the party views should not be maintained, and no party capital should be made out of the acquiescence of any section of Parliament to a conjoint scheme containing certain elements of which, as a party, they must disapprove.

While the policy of the new Minister of Health is to commit himself for the present to no particular policy, the inertia of the past is not to continue. For we understand that there is a programme to provide for 120,000 houses in the first year, the work to develop in proportion as labour and material are obtained; the former will have to be guaranteed as continuous, and the latter subjected to equitable rates of purchase. It will be as natural for a Minister of Health to turn to the medical profession of the country for assistance as it is natural for us to point out the prudence of the course. It should be and would be possible to obtain an expression of sound medical opinion upon the meaning of overcrowding, and upon the circumstances which would affect any statistics of population in this regard. Similarly medical opinion, if collected from widely separated sources and properly tabulated, would be of the highest practical use not so much in advising upon new construction as in suggesting how to transform wisely the large number of existing buildings where their condemnation would be wasteful while their application to their old purposes is lost. Another advantage of medical coöperation would be the revivifying of the powers possessed by sanitary authorities of inspecting premises with a view to their fitness for habitation: these powers are possessed but under war conditions they fell into abeyance. If buildings were transformed in consonance with medical ideas it would be an obvious responsibility upon the medical profession to see that the work was not only well done but continued to provide decent and suitable accommodation. We are not suggesting that the Minister should begin the campaign by summoning medicine to his assistance, but sooner or later he must ask medicine to stand by him in his task, and we trust it is not merely prejudice which makes us think that the sooner the invitation were given the better. In the medical profession the Minister of Health has a body of highly trained men distributed, even though unevenly, throughout the country, a large majority of whose members are personally acquainted with the results of foul or scanty housing in various environments, and a distinguished fraction of this profession are officials in his own department while members of the great medical constituency. When schemes are set in hand, as the labour and material are found, medical men should be made familiar with those schemes, when various experiences at different centres would almost automatically become common property through the medium of the medical officers of health.

SURGERY OF THE SPLEEN.

A RECENT discussion at the Royal Academy of Medicine in Ireland raised the questions when and how the spleen should be removed. Operative methods in the treatment of splenic diseases do not bulk largely in the practice of the average surgeon. There are several reasons for this. The physiology of the spleen is but imperfectly known, though it would appear to be important judged by the very profuse blood-flow through it, which is assisted by rhythmical contraction of the organ itself. This ignorance of true function has prevented the development of

surgical measures devised to influence its normal activities. It is to be noted that such surgical operations would not necessarily be performed upon the spleen itself, though should they be, the possible field of intervention is very strictly limited by anatomical conditions. Surgical therapy of the spleen resolves itself almost exclusively into removal of the organ. There are a few exceptions: occasionally a suppurating cyst or abscess requires a simple incision, whilst now and then it has seemed advantageous to perform splenopexy when the viscus has become abnormally mobile. Even here, however, in the general consensus of surgical opinion removal is preferable to fixation. A discussion of the surgery of the spleen, then, concerns itself chiefly with the consideration of the advisability of excision in certain conditions of injury and disease. Splenectomy has been performed more often for traumatic rupture than for any other affection, rupture being the commonest cause of severe intra-abdominal hæmorrhage after injury. There may be, as an associated thoracic lesion, a fractured rib, itself the actual lacerating agent, or the rib may have torn the lung and so confuse the clinical picture. It is important to remember that the intra-abdominal hæmorrhage is sometimes delayed. An interval of as long as nine days has been recorded between the time of the injury and the onset of clinical signs of internal hæmorrhage. In such cases it is supposed that either a laceration has been plugged with clot or the primary hæmorrhage has been subcapsular. A cough or other sudden movement of the patient dislodges the clot or ruptures the thin, distended splenic capsule when the catastrophe occurs. After removal of the spleen, it has been suggested recently that the blood effused into the peritoneal cavity should be returned to the circulation of the patient. Spontaneous rupture occurs in malaria and during the course of some infective diseases, as typhoid and even puerperal fever. Surgical treatment is then urgently needed, but fraught with great risk.

There are a number of diseases in which splenomegaly occurs and in which splenectomy has been tried, but until recent years with only very indifferent success. Particularly as a result of careful work in the Mayo Clinic, the indications for splenectomy in these diseases have been formulated on a statistical basis, the only possible basis in the pathological obscurity which at present enshrouds them. In that vaguely defined disease, splenic anæmia, some have claimed that removal of the spleen has brought about complete cure. Whether this can be substantiated is open to doubt, but certainly after splenectomy improvement nearly always takes place, and the measure should be recommended in view of the hopeless outlook with medical treatment alone. At the Mayo Clinic the operative mortality in 71 cases was 12·6 per cent. In pernicious anæmia the ultimate results are not so good, but the mortality was brought down to less than 6 per cent. (in 54 cases) and the patients live, on an average, two and a half times as long as non-splenectomised patients. In this disease the removal of suspected foci of infection is essential, and in all these cases blood transfusions are almost indispensable if we are to obtain the above happy outcome in a high percentage of operations. In the different forms of leukæmia splenectomy has always been regarded as exceedingly fatal. Adhesions are usually present and abundant; their separation leads to hæmorrhage, which is not easily controlled. At the Mayo Clinic this difficulty has been overcome by a preliminary treatment with radium, by which the spleen is made to diminish in size temporarily. In this way 29 splenectomies were performed for myeloid leukæmia, with only one death; the lives of these patients were certainly prolonged by the operation. In hæmolytic icterus of the acquired type complete cure results from splenectomy, and the operation should be advised; it should never be done in the familial type, as such patients may live to an advanced age and suffer no inconvenience from the condition. Finally, in Gaucher's disease splenectomy has not been found to be very effective.

To sum up, it will be seen that a degree of alleviation, in some cases quite great, can be brought about in certain grave diseases associated with enlargement of the spleen by its removal. The operation, however, is always hazardous, and should not be undertaken except in favourable surroundings and after careful preparation of the patient, by blood transfusion as a rule, by the therapeutic application of radium sometimes.

THE FAT-STANDARD OF COWS' MILK.

EVER since the passing of the Sale of Food and Drugs Act of 1875, there has been discussion as to what composition should entitle cows' milk to be regarded as genuine. Twenty-five years ago a presumptive standard was set up, to the effect that, unless the milk contains 3 per cent. of fat and 8·5 per cent. of non-fatty solids it is not genuine, fat having been abstracted or water added—unless the contrary is proved. Reports on samples taken all over the country under the above-mentioned Act show that the average fat-content of all samples, including those obviously adulterated, exceeds 3·5 per cent., and is usually about 3·6 per cent. The standard of 3 per cent. is therefore a low one, and for this reason the Regulations of 1923 prescribed that the equivalent of fat in condensed or dried milk must be calculated on a 3·6 per cent. basis. For the moment, therefore, there is a legal standard of 3·6 per cent. of fat for condensed and dried milk, and a presumptive standard of 3 per cent. for ordinary milk. The Scottish Inter-Departmental Committee has recently expressed its dissatisfaction with this presumptive standard, and has recommended the substitution of a legal standard of 3 per cent. fat and 8·5 per cent. of non-fatty solids, evidently in hope of raising this standard later. The presumptive standard has certainly not worked well. Many conflicting decisions have been given. It has been held on the one hand that any fluid which comes from a cow's udder is milk, and on the other that a farmer may so treat his cows, by poor feeding and unequal inter-milking intervals, that the fluid coming from the udder may be regarded as not being milk. In some parts of the country, especially where the inter-milking intervals are very unequal, it has always been possible to procure expert evidence that the morning milk of a single cow frequently, and the morning milk of a herd occasionally, contains less than 3 per cent. of fat. Prosecutions are not undertaken when the fat is only 5 or 10 per cent. below the standard, and frequently fail when the deficiency is much greater. The presumptive standard of 3 per cent. is virtually only one of 2·7 per cent. The quality of milk as now supplied depends chiefly upon the honesty of the vendor and the complacency or otherwise of the buyer; during the period since 1875 we have got back to the principle of *caveat emptor*.

Among agriculturists it is recognised that, provided a cow enjoys a good ration, the fat-content of its milk is little affected by changes in its dietary. The late Mr. JOHN SPEIR, a member of the second Royal

Commission on Tuberculosis, produced much evidence in support of this view. Morning milk contains appreciably less fat than afternoon milk, and doubt may arise as to whether this difference is accounted for entirely by the difference in the inter-milking intervals. The publication by Mr. WILFRID BUCKLEY in pamphlet form of the result of experiments carried out at his Basingstoke farm, comes opportunely. The pamphlet is entitled "Some Observations on the Butter-Fat in Cows' Milk," and describes two investigations carried out in 1915 and 1922 respectively.

The first investigation dealt with the morning and evening milk of 65 shorthorn cows for 39 days (from April 18th to May 26th, 1915). From April 18th to May 5th the cows were stall-fed on a ration controlled by Mr. JAMES MACKINTOSH, a well-known authority on the feeding of dairy cattle. After May 5th the cows were turned out to grass, and had no other food. The analyses were made on behalf of the medical officer of health of Hampshire by Mr. SLIM, who resided at the Basingstoke farm during the investigation. At first all the cows were milked after intervals of 15 and 9 hours respectively, but later the intervals of two sections were changed to 13 and 11 hours and 17 and 7 hours respectively, while the third section kept to the intervals of 15 and 9. On nine mornings out of the 39 the mixed milk of the 65 cows fell below 3 per cent. of fat, the lowest record being 2·7 per cent. On the other hand, on only nine evenings did the mixed milk of the 65 fall below 3·9. On May 4th the morning mixed milk of the herd gave 3·17 per cent. of fat, and the evening milk 4·14 per cent. During this day 17 out of 63 cows gave milk containing below 3 per cent. at the morning milking, while 2 out of the 63 gave milk containing under 3 per cent. of fat at the evening milking. The morning and evening milk of a single cow (No. 195) for the whole period is given as an extreme example of variability. The morning milk of this cow varied in fat from 1·7 per cent. to 5·9 per cent., while her evening milk varied from 2·5 per cent. to 7 per cent. On the evening of May 1st this cow gave 9 pints of milk containing 6·3 per cent. of fat, on the following evening 9 pints containing 3·2 per cent. of fat, and on the morning between 11 pints containing 1·8 per cent. of fat. This cow appeared to be in excellent health throughout. The figures given show that, as a rule, the percentage of butter fat increases with the progress of lactation. The change from stall-feeding to grass was accompanied by a reduction in the percentage of fat for the whole herd from 3·71 to 3·61.

The second investigation was conducted by Mr. J. R. FRASER, of the Government Laboratory, on behalf of a committee of the Medical Research Council, several of whose members were present throughout.

The second investigation lasted five days, from April 24th to April 28th, 1922, and confirmed the results of the first with respect to the daily variation in the fat percentage of the milk. One cow in this investigation gave about 6 gallons of milk daily, and an average of 2 per cent. of fat in the morning and 4 per cent. in the evening. Her subsequent record was kept, and although for the next few months she seldom gave 3 per cent. of fat in the morning, her annual yields of fat and non-fatty solids were 2·14 and 2·25 times those of the average milch cow in Great Britain.

The experiments with regard to altering the inter-milking intervals gave somewhat discrepant results. We venture to suggest, however, that for several months the cows experimented on had been milked at intervals of 15 and 9 hours, and that udders probably acquire habits, and can hardly be expected to make a machine-like response to a change of this kind.

We have discussed Mr. BUCKLEY's investigations at some length, because we hope they may lead up to others. We can hardly have one legal standard for morning and another for evening milk, even should equal inter-milking intervals prove impossible to achieve. Nor do we want a legal standard of 3 per cent. of fat, when we know that the average of the milk supplied to the public at present contains nearer 3·6 per cent. For condensed and dried milk we have already adopted the standard of 3·6 per cent. Both these concentrated milks are produced in this country, and we are up against the anomaly that the morning milk of dairy-herds cannot be used alone for the making of condensed or desiccated milk without infringing the law. The problem is a difficult one, and there is no case for hurried legislation.

ANTI-LEPROSY MEASURES.

THE object of the British Empire Leprosy Relief Association is to stamp out leprosy in the British Empire, and the Viceroy of India, in his message to the Mansion House meeting last week, was no doubt perfectly justified in saying that the time is auspicious for an earnest campaign to combat this terrible scourge. Time was when nothing but the certainty of a specific cure would have obtained from a benevolent public the means to carry out effectively such a campaign. Fortunately the Association is not lending itself to propaganda which cannot be fully substantiated, and a larger public is likely to enter with zest into the game of attacking a disease in which resource and ingenuity are essential and in which finesse is not out of place. Leprosy when acquired is not the inevitable and incurable horror which it is held to be; it is a self-healing disease, in typical cases of which immunity is gradually produced. We are happy to set out and emphasise this statement of Dr. ERNEST MUIR, research worker in leprosy under the Indian Research Fund Association and successor to Sir LEONARD ROGERS in his work at the Calcutta School of Tropical Medicine and Hygiene. From new knowledge of the natural history of the disease will follow logically the methods by which its recovery can be helped or accelerated. During the first two stages the chief object of treatment is to restore the lowered tissue resistance and prevent the disease from passing on into the third stage. When, in spite of these attempts, the third stage has been reached, the aim of treatment is then to bring about moderate reactions so as to hasten the resolution of the lesions before deformity and disablement occur. Finally, in cases which have passed through the third stage, cure may be hoped for in so far as active disease is concerned. These are the immunological principles upon which the campaign will be based, and as Prof. ROGERS was at pains to set out, the Association will make a threefold effort (1) to bring known improvements in treatment within the reach of existing lepers, (2) to support existing efforts at segregation so far as the schemes are sound, and (3) to inaugurate research into the spread of the disease and further possible improvement in the methods of local treatment. For it is surely unjustifiable, as indeed the International Leprosy Congress agreed last year, to segregate lepers for the benefit of others without supplying the best possible treatment for the victims. This is a reasonable campaign to which the best powers and abilities of many varieties of workers can be unhesitatingly given. It is worthy of support by a thinking public.

Annotations.

"Ne quid nimis."

EASTER MEDICAL TOURS IN FRANCE.

THE eighteenth Voyage d'Études Médicales will take place at the Easter season of this year. These tours are organised by a central bureau in Paris, and are under the scientific direction of Dr. Paul Carnot, professor of therapeutics in the University of Paris, assisted by his professeur agrégé, Dr. Rathéry. For 14 years before the war the V.E.M., as the organisation is known to French medical men, conducted tours designed to make better known to French and foreign doctors the various spas of France. After an interruption of six years the tours were resumed in 1921, and have grown increasingly popular in this country. Each year a different district is chosen for study; in 1922 a visit was paid to the sulphur springs of the Western Pyrenees, of which a full and illustrated account appeared in THE LANCET.[1] In the autumn of 1923 a delightful journey was taken through Savoy, the Dauphiné, and the Jura, where the claims of several well-known spas were studied. This year the projected tour embraces the spas of the Mediterranean, and in consequence the usual date has been altered, for late summer does not offer the ideal climatic conditions from the therapeutic point of view. Easter has therefore been selected as the most advantageous season, but as the holiday time at the disposal of doctors at this period of the year is generally limited, the eighteenth V.E.M. will consist of three independent tours. The principal tour will include the resorts in Provence and on the Côte d'Azur, and will extend from April 17th to 23rd. The starting-point is Aix-en-Provence, and members will disband at Nice. The number of participants is limited to 180 and the cost of the tour is 450 francs.

A preliminary tour of the resorts of Cerdagne and the Pyrénées orientales is under consideration. Members are due to arrive at Carcassonne individually on April 13th, and after visiting the town will leave on the following day by motor cars for the Valley of the Aude, Usson-les-Bains, Mont-Louis, Font Romeu, les Escaldes, Thués-les-Bains, Vernet-les-Bains, Le Boulou, Amélie-les-Bains, Banyuls, and Montpellier; joining the principal tour at Aix-en-Provence on the morning of the 17th. The maximum number of participants is 60, and the approximate cost 350 francs. Lastly, a tour is contemplated in Corsica for the period from April 23rd to 27th, crossing from Nice to Bastia, and proceeding to Orezza, Corté, Vizzavona, Piana, and Ajaccio. The return journey to Nice, or, if possible, Marseilles, will probably be made on the evening of the 27th. This tour is also confined to the maximum number of 60 members and will cost 400 francs. As in former years, a reduction of 50 per cent. will be granted by the French railways to doctors and medical students (from place of residence or from the frontier station to the place of concentration and vice versa). It must be noted, however, that the committee of the principal railways have decided to cease the extension of this facility to the wives or daughters of doctors.

Any members of the medical profession desirous of participating in the eighteenth V.E.M. are asked to communicate as soon as possible with Madame M. C. Juppé-Blaise, representative of the French Spas, at the Office Français du Tourisme, 56, Haymarket, S.W. 1. They are requested to state whether, in addition to the principal tour of the Côte d'Azur, they wish to take part also in the tour of either Cerdagne or Corsica, or both. Participants who wish to be accompanied by their wives or daughters, should circumstances permit of suitable arrangements being made, are asked to state whether they would be prepared to go alone in case such arrangements could not be carried out.

[1] THE LANCET, 1922, ii., 824, 880.

MUSCULAR ABNORMALITIES.

IN a paper on this subject in our present issue Prof. Gordon Harrower mentions four or five interesting abnormalities which have come under his notice in the dissecting room at Singapore. Two of these muscular anomalies, at least, have the added interest that they might conceivably possess a clinical bearing. The rectus sternalis is a well-known variant. Prof. Harrower figures a very well-developed bilateral specimen. It must be recognised, however, that the muscle is usually unilateral, but when it is double it may have different shapes and directions of its fibres, and during life, if contracting, may produce very curious effects, quite inexplicable to those that are ignorant of the structure. The careful studies of nerve supply mentioned by Prof. Harrower are of great interest to the morphologist in view of the present tendency in viewing the muscle. His division of the specimens into two classes appears to be acceptable, but this does not exclude a mixed class more or less analogous with the fibres of the "achselbogen." The abnormal additional origin of the gastrocnemius is one which might cause confusion in operative measures undertaken in this region. Such slips, arising like this one or from some adjacent part, are not excessively rare, and on that account perhaps deserve notice. Without definitely adopting the views of Testut and others, that these structures are always atavistic, it might perhaps be conceded that such extra-popliteal origins of the gastrocnemius are remnants of a more extensive or conjoined area of origin, pierced by the enlarging anastomosis which forms the popliteal artery.

CLINICAL RONTGENOLOGY.

THE phrase is ungainly, but it describes accurately enough the subject-matter of a much needed work from the Mount Sinai Hospital, New York, on all aspects of the radiology of the chest.[1] Drs. Wessler and Jackes make no extravagant claims and have not hesitated to point out the limitations of X rays in respect of diagnosis. The reader is warned against making a hasty diagnosis from the plate, for the blood-vessels and bronchi throw shadows which vary in different normal lungs and which should not be confused with shadows resulting from disease. Especially difficult to interpret are the shadows of the lung roots, and we agree with the authors that it is "particularly unfortunate that the shadows at the roots of the lungs have so often been made the basis for the diagnosis of pulmonary tuberculosis by roentgenologists." The authors are of the opinion that the earliest lesions in pulmonary tuberculosis appear in the infraclavicular region near the apex of the lung, and are nearly always unilateral. Hilum tuberculosis they believe to be very rare, and the so-called peribronchial phthisis to be the result of shadows of dilated blood-vessels and lymphatics. For the early diagnosis of pulmonary tuberculosis fluoroscopy is important as it will show deficiency of aeration at an apex and also abnormalities in the movement of the diaphragm, but shadows due to areas of disease are more easily seen on the plate. The authors state that an area of infiltration situated near the surface of the lung must be at least 4 mm. in diameter to cast a shadow, and the deeper the disease is situated the less clearly will it be seen. There are numerous plates showing pulmonary tuberculosis in all its stages, and of special interest are the three plates illustrating a case of acute pulmonary tuberculosis in its early, middle, and late stage. Undoubtedly X rays are of great value in the early diagnosis of pulmonary tuberculosis, but the history and condition of the patient must be taken into account, for similar shadows may be cast by non-tuberculous conditions. The question as to whether a lesion is active or arrested should, we are told, be

[1] Clinical Roentgenology of Diseases of the Chest. By H. Wessler, M.D., Adjunct Physician and Associate Roentgenologist, Mt. Sinai Hospital, New York; and Leopold Jackes, M.D., Roentgenologist to the hospital. Troy, N.Y.: The Southworth Company. 1923. With 430 plates. Pp. 560.

wisely left to the clinician. In discussing advanced tuberculosis it is shown how sometimes blood-vessels or pleural adhesions may cast shadows closely resembling cavities, and these shadows are accentuated by pneumothorax. It is unfortunate that X ray findings are not more frequently compared with post-mortem results, or by this means alone could the real meaning of the various shadows be put beyond doubt. Dr. Homer L. Sampson in a recent article [2] describes an experiment in which ten guinea-pigs were inoculated with tubercle bacilli by inhalation and killed at three-day intervals after the tenth day. X rays showed small shadows after the sixteenth day which proved to be tubercles. He does not think the shadows of tuberculosis absolutely typical of the disease, but they usually form a characteristic picture. The article is well illustrated by a series of 16 radiograms. Such works as these are welcome because, although the X rays are of importance in chest work, the clinician is as apt to underrate their value as the radiologist is to exaggerate it.

FOOT-AND-MOUTH VIRUS AND MONKEYS.

ATTENTION was called last week to the probable susceptibility of rodents to the virus of foot-and-mouth disease. A short paper in the most recent number (December, 1923) of the *Annales de l'Institut Pasteur* relates certain preliminary attempts by MM. Menzinescu, Baroni, and Calinescu, carried out between December, 1913, and June, 1914, to transmit the disease to other animals. All experiments upon cultivation, using most of the media and special techniques which have from time to time been devised for the culture of delicately growing organisms, then gave entirely negative results. In a further series of experiments attempts were made to grow the virus in collodion sacs within the peritoneal cavity of various animals, a procedure which has proved successful in the case of certain other filtrable viruses. In no case was success achieved, but, on the contrary, the virus rapidly became ineffective under these conditions and was presumed to have died. In other experiments Chamberland bougies were filled with virus-containing fluid and introduced into the peritoneal cavity of susceptible animals. In these cases the animals speedily contracted the disease, presumably by penetration of the virus through the porous walls of the filter. The fluid contained within the filter candle was found to retain its infectivity after a sojourn of eight days in the peritoneal cavity. Attempts to transmit the disease to rabbits, by various routes successful in other diseases, altogether failed, but in seven cases in which the virus was injected into monkeys there appeared, after an incubation period of three to five days, a vesicular eruption affecting the skin and mucous membranes, accompanied by a brief access of raised temperature. It would seem, therefore, that such animals are definitely susceptible, and if this is found to be the case at the hands of other workers it should prove a valuable step forwards in the investigation of a baffling malady.

TUBERCULOSIS IN INFANCY.

Dr. Norman B. Capon,[3] hon. pædiatric physician to the Liverpool Maternity Hospital, who records a remarkable case of tuberculosis in infancy, remarks that in most examples of tuberculosis at this age the disease has been acquired after birth either by inhalation or ingestion of tubercle bacilli. The present case, in which death occurred on the forty-first day after delivery, illustrates the difficulty in deciding by what route infection had taken place. The mother, aged 29, was admitted to hospital to undergo Cæsarean section for pelvic deformity. Her previous five labours had been instrumental and had resulted in stillbirths. Cæsarean section was performed and a full-term and apparently normal infant, weighing 8 lb. 12 oz., and measuring 20 in. in length, was delivered. The placenta, umbilical cord, and membranes were macroscopically normal and were not saved for microscopical examination. The mother's temperature rose to 101·6° F. on the day after the child's birth, and ran a remittent course until death, which occurred 44 days after delivery. The autopsy showed that death was due to acute miliary tuberculosis, tubercle bacilli being found in the lungs, brain, spleen, kidneys, and uterus. The baby was breast-fed for a few days after birth, but as the mother's temperature did not fall, artificial feeding was substituted. The child, however, remained in contact with her mother for the first 25 days of life. When first seen by Dr. Capon 33 days after birth the child was marasmic and of a bluish colour. There were no physical signs of lung disease, but the abdomen was distended and the liver and spleen were enlarged. Wasting became more pronounced, pyrexia developed and continued until death. At the autopsy the principal morbid changes were found in the lungs, spleen, and liver, which showed scattered throughout their substance tuberculous masses of various sizes, most of which had undergone necrosis and caseation, except in the lungs, where no caseation was found. The mesenteric glands showed almost complete necrosis and caseation at their centres. Small areas of caseation were also found in the thymus. Dr. Capon discusses the possible channels of infection by which an infant may become tuberculous—viz., germinal infection, intra-uterine infection, intra-partum infection, and neo-natal infection—and while maintaining that it is impossible to state definitely the route by which infection occurred, especially in view of the fact that the placenta was not examined histologically, points out that the advanced stage of the lesions found in the child's viscera supports the possibility of intra-uterine infection. There is no satisfactory treatment for tuberculosis in the newborn, but prophylaxis demands that a baby born to a mother with active pulmonary tuberculosis should be removed from her as soon as possible and isolated from other babies.

MALTA FEVER AND EPIZOÖTIC ABORTION.

THE organisms responsible for Malta fever in man and epizoötic abortion in cattle are hardly distinguishable from one another by laboratory tests, and there is evidence that vaccination with one may protect against the other. Epidemiologically the distinction is quite clear: the one causes Malta fever in goats and men, while the other is still more widely prevalent in cattle and to some extent in pigs. But there is no evidence that Malta fever ever gives rise to epizoötic abortion or vice versa; the diseases breed true, though the organisms are nearly identical by other criteria. It has been suggested that the old agricultural custom of running a goat with cattle in the fields as a preventive against abortion may represent a realisation of a close relationship and the possibility of prophylactic inoculation; some notes on the practice in different parts of England and Scotland have appeared in our columns.[1] Careful work[2] by Miss Alice Evans on a large number of strains from various sources has shown that the organisms can, by agglutination and absorption tests, be divided into two main groups: *Brucella melitensis melitensis* from goats and man, and *B. melitensis abortus* from cattle and pigs; the differences are quantitative rather than qualitative, and are not great. In the *Johns Hopkins Hospital Bulletin* (1924, xxxv., 6) Dr. C. S. Keefer gives a very full account of one of the few cases of Malta fever which have been identified in America. The clinical course was typical, and the organism was repeatedly isolated by blood culture. The patient had never been abroad, nor for a long time outside the city of Baltimore, and had had no contact with goats. What is of particular interest is that Miss Evans found the strain isolated from

[2] The Use of X Rays in the Differential Diagnosis of Pulmonary Tuberculosis, the British Journal of Tuberculosis, January, 1924.
[3] British Journal of Children's Diseases, October–December, 1923.

[1] THE LANCET, 1922, ii., 546, 743.
[2] Ibid., 1922, ii., 979.

him to belong to the *abortus* subspecies. Epizoötic abortion is common enough in the Eastern States, and almost everybody is apt to come into contact with it through milk. We have here, then, apparently for the first time, an example of variation in the pathogenic relations of this organism. Cases cannot be common. But they may be less rare than is supposed, for the symptoms of human infection are sometimes equivocal, especially if the possibility of Malta fever is not in mind. A certain number of the obscure pyrexias may turn out on fuller and specific examination to be *abortus* infections, the possibility of which is almost universally present.

The other familiar example of the pathogenic distinction of almost identical organisms is found in plague and pseudo-tubercle. The organisms are indistinguishable and to a certain extent cross-vaccination succeeds. But plague is a disease of rats, and pseudo-tubercle a disease of guinea-pigs, and there is no direct evidence that one may become the other. It is, however, obviously possible that some of the obscure outbreaks of plague, such as that in Suffolk a few years ago, may have been due to a variation of the pseudo-tubercle bacillus in that direction—a possibility not much more difficult to believe than the well-known facts of variation in cultural characters.

READING IN BED.

READING in bed, as Becky Sharp might have said, "may be wicked, but it's natural," and many people confess to being incurably addicted to the practice. Books to be read in bed naturally divide themselves into two classes, those which do not keep the reader awake and those which provoke an exposition of sleep. Mr. Osborn's lists of books,[1] including those from which excerpts are given, all fall into the former class, except, somewhat oddly to our thinking, Malory. Of the latter class we can quote two, of which we feel certain Mr. Osborn will be glad to know—namely, the Rev. Robert Montgomery's poem "Woman: The Angel of Life," and a book of surpassing excellence in its way—namely, "Mogg's 10,000 Cab Fares." The former work, as Thackeray discovered long ago, has the great advantage that it makes just as good sense read from the end to the beginning, as from the beginning to the end, while the latter not only is the sole work of literature which appealed to Mr. Soapy Sponge, but in addition can transport the reader to realms of dreams in which, as is the way of dreams, he may traverse London in several directions at once. Let the sleepless reader once begin "Acton five, from the end of Oxford Street and the Edgware Road—see Ealing; Edmonton seven, from Shoreditch Church—'Green Man and Still,' Oxford Street, Shepherd's Bush and Starch Green, Bank and Whitechapel . . ." and sleep will come. Mr. Osborn's introductory essay is delightful reading, especially his précis of the Russian novel, but all the same we do not think he can have read Chekhov. The authors from whose works he gives selections are mostly not later than the eighteenth century and include such masters as Thomas à Kempis, Robert Burton, Apuleius, Froissart, and Sir Thomas Browne, while of the two moderns Mrs. Gaskell is represented by the till recently unpublished record of the childhood of her daughter and a very charming record it is. The latter half of the book is made up of a fragment from Anatole France's "Clio," a paper on "Dreams" by Lady Grey of Fallodon, an admirable antidote, as Mr. Osborn says, to the Freudian theory on the subject, and sundry papers by Mr. Osborn himself, all of which are restful and pleasant reading. One of these deals with Christmas carols, again delightful to read in bed or anywhere else, but which cannot be written now, and another with epigrams of which Mr. Osborn quotes a few, both ancient and modern. We will add one, known to few, but all the same singularly happy. All Eton men whose memory of masters goes back to the "seventies" of the last century will remember Russell Day, a great mind in a small body. One of his relatives married a Miss Week, and Day handed in the following at the wedding:—

> "A Day the More a Week the Less,
> Yet Time must not complain,
> There'll soon be little days enough
> To make a week again."

Another paper discourses pleasantly on diaries, in which Mr. Osborn naturally gives the palm to Pepys. But we recently came across another diary or excerpts from it, rescued from oblivion by Mr. R. L. Hine in his book (a bedside book of the best class) called "The Cream of Curiosity." The diary in question was kept by Justinian Paget, born in 1610, in which we find such entries as the following: "I lay in bed musing till 9 o'clock which caused a dulness in my head with losse of so much time. *Resolve* that wakening at 5 o'clock I will knock with my bedstaff to waken Elias, who shall presently rise and make a fire whilst I rubb my body and then I will presently skip out of bed." A marginal note adds, "I must have ye tinder box with me."

Sleeplessness is a sore trial to many, and even though we are indebted to the condition for some masterpieces of literature such as Statius's poem to Sleep, it is a condition to be combated. Mr. Osborn's book will certainly be a boon to the sleepless.

[1] Night Caps; The Gentle Art of Reading in Bed Explained and Illustrated. By E. B. Osborn. London: G. Bell and Sons, Ltd. 1924. Pp. 341. 7*s.* 6*d.*

ULTRA-VIOLET IRRADIATION OF THE MOUTH.

AT a meeting of the Odontological Section of the Royal Society of Medicine on Jan. 28th Mr. P. S. Campkin showed an apparatus for applying ultra-violet rays in the mouth, invented by Mr. R. B. C. Sheridan, Barrister-at-Law. The device[1] consists of a mirror and two quartz lenses of different powers, all of 41 mm. diameter, and mounted on short handles connected by a pivoted hinge. The mirror is adjusted so that the patient can see the interior of his own mouth when the lenses, which are permeable to ultra-violet rays, are arranged to focus the sun's rays on an area of about the size of a threepenny-piece. For irradiating areas in the front of the mouth the two lenses are superimposed; if a longer focal length is desired—e.g., for the back of the mouth—one lens may be pushed aside. Should sunlight not be available the light from a mercury-vapour or an arc lamp can be substituted. The device is intended to be used by the patient at home. Mr. Campkin stated that he had found ultra-violet radiation thus applied useful in promoting the healing of raw surfaces following extraction of teeth or the removal of cysts, as well as in marginal gingivitis and after excision of hypertrophied gums. Radiation is applied for a period of five to ten minutes two or three times a day. Mr. Campkin went on to suggest that the device might be useful as a prophylactic measure against pyorrhœa; adding that the exposure was so short as to eliminate any danger of burning. The device had received favourable comment from Dr. Murray Levick, who thought it should prove useful for the treatment of oral lesions. On the analogy of the use of ultra-violet rays for other conditions, it seems reasonable to assume that the healing of the oral tissues may be hastened by the use of these rays in the mouth. Personal equation comes much into play in estimating the value of such treatment, especially when it is ancillary to dental treatment of other kinds, and until a large number of cases have been treated by different observers, the actual therapeutic value must remain uncertain. Mr. Campkin alluded to the risk of burning, and we should like to have assurance from physicists and those versed in heliotherapy that burning is optically impossible. There is a wide difference between the use of an instrument under careful supervision in hospital and as a form of home treatment.

[1] The apparatus has been protected under the name "Oralight" lens, and can be obtained from Messrs. Pankhurst and Barritt, 56, New Cavendish-st., London, W., at a cost of 30*s.*

MANGANESE IN HARROGATE WATERS.

THE pharmacology of manganese as a constituent of many medicinal waters has not been the subject of extensive research. Though the amounts present are usually small, they are amenable to accurate measurement, and the chemical importance of the element is sufficient to warrant some discussion. Potassium permanganate is the only salt compound of manganese in the official pharmacopœia, and in this case it is not the manganese but the high oxygen potential of the acidic ion which is required in the prescription. Recent developments of colloid therapy have focused attention on manganese in the colloidal condition. Years ago it was more freely prescribed. As a cathartic the salts were given in combination with other purgatives such as senna, and in doses of 5 to 10 gr. it was prescribed as a tonic, sometimes in place of iron. It was also supposed to have an action on hepatic function, increasing the secretion of bile. Dr. David Brown has shown the action of sulphur water to be one of increased oxidation. "The evidence brought forward," he wrote,[1] "as to the stimulation of a ferment like the xanthin oxidase of the liver suggests that its principal effect may be brought about by a peroxidase." Mr. A. Woodmansey, M.Sc., analyst at the Harrogate Royal Baths, calls our attention to the fact that the Old Sulphur Water of the spa contains small amounts of manganese which may be responsible for the observed effects. The amount of manganese in the other waters is as follows:—

	Manganese (parts per 100,000).
Old Sulphur Water	0·03
Strong Montpellier	0·04
Mild Sulphur	0·025
Chloride of Iron	0·04
Crescent Saline	0·12
Tewit (Tuewhit)	0·044

The outstanding property of manganese, its activity as a catalyst in the promotion of oxidation, explains its effect on plant and mould growth. The oxidising enzyme of the lac tree has been found to contain much of the element, and it is highly probable that manganese may function as a peroxidase under certain conditions. The manganese content of the Harrogate waters is sufficient in quantity to merit an investigation of its catalytic possibilities. Work is now being done in order to find whether the manganese of imbibed waters is immediately excreted or retained by the body.

ON ŒDEMA.

IT was for a long time customary to consider œdema as a chapter in the pathology of lymph formation, and it was in this country sadly mixed up with the Starling-Heidenhain controversy about lymph flow; it was overlooked that the mystery of œdema is not why more fluid leaves the vessels for the tissue spaces, but why it stops there instead of draining away into the veins and lymphatics. During the last fifteen years or so—starting perhaps with the splendid chapter in Lazarus-Barlow's "General Pathology"—one has come to look on œdema as due to interference with the mechanism which regulates the distribution of water in the body between the blood, the lymph, and the tissue fluid. The main factors as far as we know which determine this distribution are the permeability of the capillary wall (as in histamine wheals) and the concentration of dissolved substances (as in salt œdema). Prof. L. Loeb has put together[2] an admirable conspectus of the subject from this point of view, discussing systematically the considerable volume of germane investigations made in recent years, and dealing fairly with the pros and cons of the various ideas which have been put forward to explain the common, and still the most complicated, cases of œdema in cardiac and renal disease. In the former class, for example, the meaning of Bolton's classical work in making the traditional mechanical explanation quite impossible is fully appreciated; in the latter, the possibility is raised at some length that the immediate cause of the accumulation of fluid in the tissues is not the failure of the kidney to excrete but the production by the kidney of something, possibly the soluble products of autolysed cells, which alters the permeability of the capillary walls throughout the body—a suggestion made by Chisolm ten years ago. The book is a solid piece of work, not very lively reading for the style is rather dull, but it not only sets out the state of present knowledge on the subject, but suggests many new lines of inquiry.

[1] Some Pharmacological Effects of Strong Sulphur Water. Proc. Roy. Soc. Med., May, 1911. David Brown, M.D.

[2] Edema. By Leo Loeb. Baltimore: Williams and Wilkins Company. 1923. Pp. 178. $3.50. Reprint of a quarterly part of Medicine, 1923, ii., 171.

THE LATE PROF. MARCUS HARTOG.

MANY members of the medical profession will have learnt with regret the recent death in Paris of Prof. Marcus Hartog, who for 41 years was associated as a teacher of biology with the medical schools of Manchester and Cork. He had retired from work for several years and had reached the age of 75. A versatile and learned writer, we were on many occasions the recipient from him of notes, generally in amusing vein, illustrative of quasi-medical points, his justification for appearing anonymously in a professional newspaper being that his long connexion with medical education had made of him "a perpetual student." The last such note, written in refutation of the public belief that the rocking cradle was bad for the infant is a good example of his shrewdness to detect the fallacies of popular theories:

"One great objection has been that rocking stirs up the pulpy brains. Now the brain and other liquids completely fill up the cavity of the skull, and, moreover, it is traversed by intersecting membranes. You can't agitate even water in a completely full vessel, and the brain is very much less fluid than water, or even gum-water; try the experiment and you will see the absolute futility of the theory. In the next place consider the zoological argument. The infant ape is carried about either clinging to the fur of its mother, or held in its arms, but despite the constant rocking it must get, its health doesn't suffer. The habits, and I may say the instincts, of women are all in favour of rocking. When a woman takes a child in her arms she at once begins swaying to and fro, if standing; when she walks, of course the child she carries is rocked. The Indian and Ceylonese mothers extemporise a hammock of a sheet suspended from a tree for the infant to sleep in, and from time to time give it a swing with the hand or foot. I think it very unfair that after the nursling has enjoyed some months of rocking with every movement of its mother, it should be suddenly deprived of its wonted passive exercise."

Prof. Hartog's equipment was remarkable. To an intimate acquaintance with zoology, botany, and even geology, he added the ability to read and correspond in five languages and was a keen and critical appreciator of music. Although his academic work was mainly in biology, he started his scientific career as assistant-director of the Ceylon Botanical Gardens.

AFTER-CARE OF TUBERCULOUS EX-SERVICE MEN.—The Minister of Pensions announces that arrangements have now been made to secure the coöperation of the local agencies of the Ministries of Labour and Pensions with the local health authorities in the after-care of ex-Service men suffering from tuberculosis. Six weeks (or as long as possible) before the tuberculous man's discharge from an institution, the notification of the pending discharge will be sent to the tuberculosis officer of the man's place of residence. Thereupon, special steps will be taken, on the one hand, so that, as far as possible, the patient shall not return to home conditions which are likely to prevent the satisfactory progress of the case or to cause a relapse; and at the same time, on the other hand, to do all that is possible to assist the man to obtain employment in a suitable occupation. So far as the man's home conditions are concerned, the tuberculosis officer and his staff, or the Tuberculosis Care Committee, if one has been established in the area, will, if these conditions are unsatisfactory, take such action as may be practicable to improve them. As regards the man's employment, if the tuberculosis officer considers that the man's occupation is unsuitable, he will furnish the Employment Exchange with a list of occupations which he considers not definitely unsuitable for the case. The Employment Exchanges will render all possible assistance in this matter, and special efforts will be made by the King's Roll Committee and by the Chief Area Officer and the members of the War Pensions Committee.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LVII.—THE TREATMENT OF ACUTE SEPTIC INFECTION: SEPTICÆMIA.

FOLLOWING infection of certain tissues by certain micro-organisms, the disease process is apt to spread rapidly, and sooner or later microbes extend beyond the site of primary infection and entering the blood-stream multiply therein, giving rise to septicæmia.

The tissues infection of which is specially prone to be followed by symptoms of general infection are bone (osteomyelitis); the uterus—e.g., puerperal sepsis; the skin and subcutaneous tissues—e.g., erysipelas, cellulitis, an infected wound; the middle ear and upper respiratory tract. In osteomyelitis the infecting agent is usually *Staphylococcus pyogenes;* of the remainder *Streptococcus pyogenes* accounts for the large majority.

The diagnosis of a generalised infection is often difficult on clinical grounds alone; the general condition of the patient is apt to be deceptive, particularly in the more acute cases. The diagnosis will be based on (1) a sudden rise of temperature and in pulse-frequency, both sustained, and perhaps (2) the occurrence of chills or rigors, and (3) the development of secondary foci—e.g., pulmonary infarct, pleurisy, or arthritis. The certain sign is the presence of micro-organisms in the blood-stream, but many cases are undoubtedly septicæmic in which blood culture is negative during life; further, it may be three or four days before a report can be received—time that cannot be spared in instituting treatment. The great value of blood culture is that when positive it yields the infecting organism in pure culture. Treatment in such cases is often of little avail, but in order that the patient may have the best possible chance it is essential that it should be started early, and for this reason it is far safer to treat any doubtful case as though it were septicæmia instead of waiting for the diagnosis on the result of blood culture.

Treatment may be considered under four headings:

1. *Local.*

Efficient surgical measures for drainage and elimination, as far as is possible, of the primary focus. The importance of this first step in the treatment of infective processes cannot be too strongly emphasised; the frequency with which it is overlooked is the justification for the italic type in which it is expressed.

The same remarks apply to secondary foci which may arise in the course of the disease, but in streptococcal cases an effusion into a pleural or joint cavity may usually be aspirated, unless the liquid be thick pus, on one or more occasions before drainage is advisable. Constant watch must be kept over the pressure points—gluteal, heels, elbows, &c.—for the development of subcutaneous abscesses which require immediate incision.

2. *General.*

(*a*) *Food and Hygiene.*—Good nursing is essential. An efficient nurse will get her adult patient to take at least 4 pints of assorted fluids in the 24 hours, and the patient may be allowed anything fancied in the way of solids, regardless of temperature; it is a mistake to limit the dietary entirely to slops. Meat, fish, chicken, vegetables, and plenty of fruit and eggs should be pressed. In those rare instances in which it is impossible to get solids down, four or five eggs beaten, during the 24 hours with Benger's, ovaltine, plasmon, jellies, and meat essence must be reluctantly substituted, a return to solids being made at the earliest opportunity. The mouth must be cleaned before and after every feed, and a little simple ointment applied to the lips will help to keep them moist. The bowels should be kept on the free side. Abundance of fresh air is essential, bed on a balcony continuously is the ideal, though but rarely attainable. Great care is necessary to avoid bed-sores; the back should be washed, dried, rubbed with hazeline solution or spirit, and powdered at least every six hours. Urinary output should be measured. When the temperature exceeds 103° F. the patient should be cradled; if it rises to 104° sponging with hot water (110°) will bring it down without causing the discomfort often associated with tepid sponging.

(*b*) *Rest.*—A detail often necessary to enforce. The patient, usually mentally alert and free from headache, must be kept quiet, visitors cut down to the minimum, and all movement in bed restricted as far as possible. Sleep is of the utmost importance and must be secured at all costs, and the patient should never be awakened for feeding or treatment. Insomnia, due more often to toxæmia than pain, may yield to ammonium bromide and chloral, or medinal, if simple nursing methods fail; the constipating effects of opiates can be overcome by salines and enemata.

(*c*) *Drugs.*—The administration of medicine, stimulant, and hypodermic is to be so arranged that they do not clash. The indication for drugs as a routine in the early stage is—

(i) to aid elimination,
(ii) to prevent heart failure,
(iii) to prevent abdominal distension and diarrhœa.

To this end sodium bicarbonate may be added to barley-water, and sodium citrate to fresh lemonade; half a drachm of the tincture of digitalis should be given in the 24 hours, and will save time should the necessity for sudden digitalisation arise as an aid to pituitrin and strychnine at a later stage. A small dose of hyd. c. cret. and salol or other so-called intestinal disinfectant may be given with advantage twice or thrice daily. Brandy should be started early, but never added to a feed—say 2 oz. in the 24 hours, half of which may be given at 9 P.M. in the hope of inducing sleep.

3. *Special Treatment.*

When the above items have been thoroughly attended to, but not before, the question of specific treatment must be considered. In the case of staphylococcal infection but little is to be hoped for on specific lines, but fortunately in streptococcal infections specific therapy is often of great value.

(*a*) *Sensitised Vaccine.*—Mervyn Gordon has shown by the absorption of agglutinin test that hæmolytic streptococci can be differentiated into three distinct types. The vast majority of pyogenic streptococci causing localised or general streptococcal infections, other than scarlet fever, belong to one and the same serological type. Hence a stock sensitised streptococcus pyogenes vaccine may be used with confidence in the majority of cases, and should certainly be employed in all until an autogenous one can be prepared. For an adult the dose of sensitised streptococcus pyogenes vaccine may well be 100, 250, and 500 million given subcutaneously on three successive days; after an interval of a few days, 250, 500, and 1000 million may be given in like fashion, or perhaps 100 million daily or every other day. Alternatively to the subcutaneous route 100 to 500 million sensitised vaccine may be injected intravenously combined with antistreptococcus pyogenes serum intramuscularly. Such tactics may induce a rigor; an "extraneous rigor" in such conditions is always of good prognostic import.

(*b*) *Antiserum.*—Provided the patient has not had serum administered before and is not subject to asthma, hay fever, or urticaria, antistreptococcus pyogenes serum should be given at once; polyvalent serum under such conditions is of comparatively little value. At least 50 c.cm. are injected intramuscularly into the thigh or flank and the dose repeated in 24 hours; in urgent cases serum may be diluted with an equal volume of sterile Ringer's solution or normal saline and given intravenously. Should the patient have

ad serum previously or be an asthmatic, an intra-ermal test must first be done with the serum as a recautionary measure, and if hypersensitive, desensi-isation with small doses must be carried out before he full dose is given.

(*c*) *Peptone.*—Nolf, of Liége, first recommended the ntravenous injection of Witte peptone in septicæmia nd severe septic infection in 1917, and it is undoubtedly useful accessory to other forms of treatment. Judged olely by its immediate effect on the temperature hart, peptone in streptococcal infections would most imes be regarded as of small account, but if the eneral condition of the patient is considered one arely fails to be impressed by its worth, except in the ery acute fulminating cases. It is the general con-ition and not the chart which must be taken as the uide to the size of the dose of peptone and the requency of its administration; if it is of benefit a hange will be manifest within 12 hours of the first njection though three or four may be required before he temperature shows signs of abating. Witte eptone is given as a 10 per cent. solution in distilled ater and the initial dose for an adult is from to 8 c.cm. It should not be given to asthmatics. he requisite dose of peptone solution is drawn into record syringe fitted with a needle not larger than o. 26, to avoid the risk attendant upon a too rapid ntroduction of peptone into the blood-stream. The ntravenous injection of 8 c.cm. should occupy at least wo minutes, and during the operation the nurse keeps onstant observation on the pulse-frequency, calling ut the number of beats in each quarter of a minute; this exceeds 35, or should there be any complaint f pain or discomfort by the patient, the injection is emporarily suspended, to be resumed, even more lowly than before, when such signs have moderated. n the majority of cases of acute infection in which good result appeared to follow the intravenous njection of peptone, a rigor occurred within an hour r so of the first administration; in others the desired eaction was delayed until after the second or third ose. A rigor under such conditions is to be regarded s a favourable sign, and failure to react is of grave rognostic import.

The condition of the patient during the reaction ay be alarming to the uninitiated; for a short time he may be cyanosed, restless, dyspnœic, and the ulse impalpable at the wrist; but these signs are f short duration and relieved by brandy, hot bottles, nd a hypodermic injection of adrenalin or atropine ulphate.

The injection of peptone may be repeated in 48 ours, the dose being increased by 1 or 2 c.cm. ntravenous injection, whether of peptone, serum, or accine, should not be made directly after food has een taken.

Every case of streptococcal infection has to be udged on its merits, but for a case of, say, puerperal epsis coming early under treatment the initial easures under this heading might be—

(*a*) 100 million sensitised streptococcus pyogenes vaccine subcutaneously;

(*b*) 50 c.cm. antistreptococcus pyogenes serum intramuscularly;

(*c*) 6 c.cm. 10 per cent. Witte peptone intravenously.

4. *Supplementary.*

(*a*) *Infusion.*—In those rare instances where omiting and diarrhœa render the absorption of an dequate quantity of fluid impossible, and in which the oxæmia is overwhelming, infusion of Ringer's, or ormal saline solution, to which 5 per cent. of glucose s added, may be of benefit.

(*b*) *Transfusion of Blood* is of undoubted value, specially in subacute cases. It should be employed articularly in those associated with severe anæmia, n which it enables the patient to obtain greater enefit from other lines of treatment.

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Special Articles.

SMALL-POX AND VACCINATION.

BY C. KILLICK MILLARD, M.D., D.SC. EDIN.,
MEDICAL OFFICER OF HEALTH, LEICESTER.

Dr. J. C. McVail's Address to Members of Parliament.

ON July 25th, 1923, at the special request of the Minister of Health, an address was given to Members of Parliament by Dr. J. C. McVail on the subject of small-pox and vaccination. From the orthodox point of view it must be admitted that few men could have been better qualified for the task than Dr. McVail, who has made such a life-long study of the subject. The address has since been published as a propaganda pamphlet by the Research Defence Society, and in view of the importance of the occasion and the publicity given to it, it is desirable that it should be scrutinised somewhat closely to see how far the statements made and the arguments used represent the whole truth on this highly complex and debatable question.

Dr. McVail divided his address into four sections, each introducing a definite proposition: (1) Small-pox is worth preventing; (2) small-pox can be prevented by vaccination; (3) small-pox cannot be prevented without vaccination; and (4) properly conducted vaccination is very safe.

1. *Small-pox is Worth Preventing.*

Dr. McVail begins by pointing out that there are two very different types of small-pox—one mild, the American type; the other severe, the Asiatic type. As an example of the former he instances the recent epidemic at Gloucester with only two fatalities; whilst as an example of the severe type he instances the outbreak in the Poplar Workhouse in 1922. This outbreak, he observes, was exterminated by "vaccination and isolation."

This brings me to my first criticism. Dr. McVail was addressing Members of Parliament. The question, and really the only question which concerns them, is the necessity or otherwise of *compulsory infant vaccination.* To tell them, without qualification or explanation, that it was "vaccination" which, with isolation, exterminated the Poplar outbreak was, I suggest, distinctly misleading, though I do not suggest that Dr. McVail intended to mislead. I suggest that many of his hearers would probably think that by "vaccination" he meant infant vaccination. Yet, as Dr. McVail must admit, such vaccination had really nothing to do with stamping out the outbreak. The initial case, the inmate, H. W., who caused the whole trouble, had been vaccinated in infancy, and so had the great majority of the cases (at least 46 out of 65) which contracted the disease—directly or indirectly—from him. Of course, what Dr. McVail meant by "vaccination" was *emergency vaccination of contacts*—a very different matter—and he might have told his hearers that the very success of this kind of vaccination constitutes a strong argument against the need for infant vaccination. He might have pointed out how extraordinarily successful the emergency measures taken in the Poplar outbreak—prompt isolation of cases with vaccination and surveillance of contacts—proved; with the result that in spite of the very alarming nature of the outbreak—the congested locality right in the heart of the East End, the fatal strain of the disease, the exceptionally large number of contacts, and the great extent to which infant vaccination had been neglected in the district—it was got under complete control almost at once. He might also have pointed out that if the initial case (the man, H. W., who worked in the laundry of the workhouse) had *not* been vaccinated in infancy it is almost certain that the man would not have had such a mild and

modified attack, in which event it is very unlikely that the nature of his illness would have escaped recognition. Had it been recognised he would at once have been isolated, instead of being allowed to continue working and moving about the institution; the other inmates and staff would have been vaccinated at once, and the whole outbreak would have been nipped in the bud. In fact, Dr. McVail might truthfully have said that so far from the practice of infant vaccination helping to stamp out the Poplar outbreak, it may reasonably be regarded as the indirect cause of the whole trouble.

Dr. McVail goes on to refer to the ravages of small-pox in pre-vaccination days and draws a harrowing picture of what took place in Kilmarnock in the period 1728–64. He tells us that 16 per cent. of the total deaths were due to small-pox, as were nearly all the deaths of young children. Not content with stating cold facts, he proceeds to paint an eloquent and pathetic picture. Here is a sample :—

"In respect of small-pox there were indeed three Kilmarnocks. One consisted of the population living over 4 or 5 years of age. These were now protected against small-pox; they had already battled with and overcome the disease fiend. Many would be disfigured; some would have suffered from injury or loss of sight; some would be afflicted in various ways by the sequelæ of the disease, but they were practically safe from future attack. The second Kilmarnock lay under the greensward of the kirkyard. These had been in the same battle with small-pox, but had lost their lives and were at rest. The third Kilmarnock was that community of little children who had been born since the last visit of the pestilence. Within four or five years of birth they had to meet and fight the most terrible physical foe they would ever encounter. Human affection was as keen then as now, and I ask you to imagine what would be the feelings of a mother when she was told that the truce of God had ended, and that the town was again invaded by small-pox."

I feel bound to point out that such eloquence is really quite irrelevant and is nothing more nor less than an attempt to create prejudice (of course, this is not intended in an offensive sense). We expect this sort of thing from a clever barrister, paid to plead a cause, but it is hardly what we expect from a man of science like Dr. McVail. Dr. McVail knows quite well that the conditions in this country at the present day, as regards such a disease as small-pox, are so totally different from what they were two centuries ago that to imply, as he seems to do, that but for vaccination we should to-day be exposed to the same danger really amounts to special pleading. He might at least have pointed out that, coinciding with the perfection of modern methods of prevention, and in spite of the steadily increasing neglect of infant vaccination throughout the country, small-pox has become, during the past two decades, one of the rarest of the zymotic diseases, and the mortality caused by it has been negligible. He might further have pointed out that the American type of small-pox, which has now appeared in this country, and about which so much alarm has been raised in the press and elsewhere—which, indeed, was presumably the cause which had led the Minister of Health to invite him to give the address—had none of the terrible characteristics which he had been describing so graphically. There is practically no loss of life, no disfigurement, no injury to sight, &c.; and as for the feelings of the poor mothers, he might have said that instead of terror the disease is now apt to inspire only contempt, so much so that it is difficult to get people to treat it seriously.

2. *Small-pox Can be Prevented by Vaccination.*

This is Dr. McVail's second proposition. What exactly does he mean by it, or, rather, what would his hearers be likely to think that he meant by it? If he meant that small-pox can be prevented *in the individual* by vaccination and revaccination as often as necessary to keep the individual immune, then I quite agree with him. But if he meant, or if his hearers thought that he meant (as most of them no doubt would think), that small-pox can be prevented —i.e., effectually controlled—*in the community* by a State system of infant vaccination then I submit the proposition cannot be substantiated. Dr. McVail says that time will not allow him to submit all the world-wide statistics and experience, the accumulation of 120 years, on which *faith in vaccination* is based, but he will tell, as briefly as possible, the nature of the evidence on which medical confidence rests. "In whatever way the data are questioned, from whatever angle the problem is viewed, the conclusion is the same." Incidentally, I may remark that "faith in vaccination" is one thing; up to a point I have as strong a "faith in vaccination" as Dr. McVail himself. But faith that any system of infant vaccination will effectually control small-pox is quite another thing.

The points he adduces to support his proposition are as follows:—

(1) The mortality from small-pox has been much less since vaccination was introduced. He admits that this in itself proves nothing. The mortality of plague, cholera, and various other diseases has also greatly diminished. But he suggests that "a comparison of places and times of small-pox diminution side by side with vaccination affords strong proof of causal relationship."

(2) The altered age-incidence of small-pox. This, of course, is a perfectly sound argument for proving that vaccination confers temporary immunity against small-pox on the individual. I submit that it is no evidence whatever that infant vaccination protects the community against small-pox. It may simply shift the incidence of small-pox from one age to another.

(3) In countries which are well vaccinated and revaccinated there has been much less small-pox than where vaccination has been neglected. Dr. McVail cites as the "outstanding example" the case of Germany. He has to admit, however, that the recent position of that country is "interesting": I suggest that "disconcerting" would have been a more appropriate word. He then proceeds to explain why it is that Germany (which for years has been held up by provaccinists as the shining example of what can be done by compulsory vaccination and revaccination to abolish small-pox) has fallen so sadly from grace. In the six years, 1917–1922, he tells us, "the disease has attained quite appreciable prevalence." Nearly 11,000 cases of small-pox have occurred with a fatality-rate of 15·6 per cent. This is equivalent to *1716 deaths* from small-pox. He might have mentioned that in the same period the number of deaths from small-pox in England and Wales, without revaccination, and with infant vaccination seriously neglected, has been negligible.

We can only conclude from this that there is no longer a really outstanding example of a country which will support the thesis that "in countries well vaccinated and revaccinated there has been much less small-pox than where vaccination has been neglected." One may well ask, If Germany cannot protect herself by vaccination what country can?

Dr. McVail does not dare to suggest that in towns and localities in this country where vaccination has been neglected there is more small-pox than where the Vaccination Acts have been sedulously carried out. He knows well that he would have found it very difficult to substantiate this assertion. He knows that some of the best-vaccinated towns—e.g., Sheffield and Middlesbrough—have suffered from severe epidemics, and he knows, too, that there is at least one large town which has deliberately abandoned infant vaccination and yet has suffered no more than other towns from small-pox.

(4) In classes which have been well vaccinated and revaccinated there has been comparatively little small-pox. In support of this Dr. McVail cites the case of the small-pox nurses. Here, again, I quite accept the immunity of small-pox nurses as definite and convincing evidence that by vaccination (repeated as often as necessary) it is quite possible temporarily

o protect *individuals* against small-pox, but I submit mphatically that this is no evidence that infant accination will, or does in fact, protect the community. hus, small-pox inoculation would be equally effective though no doubt less satisfactory in other ways) in rotecting small-pox nurses, but Dr. McVail will ardly suggest that this would be any evidence that noculation would be effective in protecting the ommunity. Further, vaccination would still be uite effective to protect small-pox nurses even hough the immunity only lasted a few months, ut in that case no one would suggest that it would ave much effect in protecting the community.

(5) In towns where small-pox prevails more of the nvaccinated than of the vaccinated are attacked, specially if the vaccination is recent. This, I submit, gain, only proves that vaccination confers temporary mmunity upon the *individual*. It is no evidence that accination protects the *community*. Small-pox noculation would show the same effect.

3. *Small-pox Cannot be Prevented without Vaccination.*

Again it is necessary to ask just what Dr. McVail neans by this statement. He may mean (though doubt if the majority of his hearers would think hat this was what he meant) that it is impossible ffectually to control small-pox without having handful of vaccinated doctors and nurses to handle he disease and without vaccinating contacts. Even n this sense the statement is not really justified, ecause, of course, if there were no such thing as accination we could quite well protect our small-pox taff by inoculation, which would be equally effective f much less convenient. And as regards contacts, f these are kept under close surveillance it is very arely that they spread the disease, whether vaccinated r not. Vaccination of contacts renders valuable elp in reducing the total number of secondary cases, ut I submit that it is certainly not essential for the ontrol of the disease.

But if Dr. McVail meant that it is impossible ffectually to control small-pox without vaccination f the general population—and I suggest that this is he sense in which it is probable his hearers would nderstand him—then the statement is still less ustifiable. The whole trend of the evidence of the ast two decades tends to show that it is quite possible ffectually to control small-pox without recourse to eneral vaccination. Small-pox—at any rate the evere Asiatic type of small-pox—has been controlled ith such success, in spite of the increasing neglect of accination, that the mortality from the disease uring the past 18 years has ceased to be an appreciable actor in our vital statistics. Surely, the experience f places which have largely abandoned vaccination oints definitely to the same conclusion. It is rather emarkable that Dr. McVail made no reference in his ddress to the important experiment which has been arried on in the city of Leicester for the past 40 years. oes he really think that this experiment has no bearing pon the question at issue? He was not always so eticent. If he had been quite frank—if he had wished o put an impartial and unbiassed statement before is hearers instead of a one-sided propagandist tterance—he would surely have told them something bout Leicester's "gigantic experiment" (as a former ditor of the *British Medical Journal* called it) and of is own confident prediction that it would lead to nevitable disaster. He might have told them that n his classical work, "Vaccination Vindicated," ublished in 1887, in referring to the action of Leicester n setting the Vaccination Acts at defiance, he had ritten:—

> "The antivaccinators of Leicester . . . having to a great xtent thrown off the armour of vaccination, are waging a esperate and gallant, though misguided, conflict against he enemy. . . . But . . . in Leicester, when its time rrives, we shall not fail to see a repetition of last century xperiences, and certainly there will afterwards be fewer hildren left to die of diarrhœa. It is to be hoped that when he catastrophe does come, the Government will see that s teachings are duly studied and recorded. . . . Leicester has had little chance of getting its immunity tested. When another great outbreak occurs among the susceptible population of England it will be time enough to see how Leicester comports itself under the ordeal."

This was 36 years ago. At that time it was reasonable to suggest that there had been insufficient time for the experiment to be properly tested. It had only been in operation a few years. But this plea can hardly be put forward to-day. During the years which have since elapsed less than 10 per cent. of the children born in Leicester have been vaccinated. Small-pox has been repeatedly introduced into the city, both in the mild and severe forms, and there have been three epidemics. Yet in the 36 years, out of an average population of 200,000, there have been only 51 deaths, an average of less than two per annum. Certainly, there has been no "catastrophe" such as Dr. McVail expected. Compared with the experience of other large towns, such a result cannot be regarded as at all unfavourable. Indeed, compared with certain well-vaccinated towns, it is highly favourable.

I am not blaming Dr. McVail because his prophecy has not come true. He only believed what almost the entire medical profession at that time believed, and honestly believed. But having prophesied and lapse of time having proved his prophecy mistaken, it is surely necessary that he should reconsider the premiss on which he based his prophecy. That premiss was that it is impossible to prevent small-pox without vaccination. And yet we find him, at an important gathering of the legislators of the Realm, repeating this statement, as dogmatically as ever, and without any reference to his previous mistake. Let me ask Dr. McVail one question: Supposing the Leicester experiment had resulted as he expected it would result; would he have made no reference to it? Would he have regarded it as of no significance? I think not. The fact is that the experience of Leicester constitutes a very valuable "control" experiment, and the importance of the "control" experiment is well known to every student of science.

4. *Properly Conducted Vaccination is Very Safe.*

The safety of vaccination is Dr. McVail's last proposition, but he is careful to qualify the statement by saying "properly conducted." But if vaccination is not properly conducted, whose fault is it? Presumably, members of the medical profession, who alone perform the operation. That doctors are sometimes careless is just one of the risks attaching to vaccination which make parents object to it. But Dr. McVail may urge that one cause of danger from vaccination is that of dirt getting in after the operation. This again, in the crowded homes of the poor, must surely be regarded as one of the inseparable risks of vaccination. What consolation is it to the parent of a child who is suffering from a septic arm following vaccination to be told that it is not the vaccination which is to blame but the carelessness of the doctor or mother?

Dr. McVail says that the chief danger from vaccination feared a generation ago was that syphilis might be conveyed by arm-to-arm vaccination, but he omits to mention that this danger was strenuously denied at that time by the medical profession; or that the Local Government Board actually issued a pamphlet, since withdrawn, entitled "Facts Concerning Vaccination for the Heads of Families," in which it was confidently asserted that "the fear that a foul disease may be implanted by vaccination is an unfounded one." Dr. McVail admits that the late Jonathan Hutchinson proved that the danger of syphilis being conveyed by arm-to-arm vaccination was a very real one, but he points out truly that by the substitution of calf lymph for human lymph this particular danger has been entirely overcome. He omits to mention, however, that many doctors believe that calf lymph is more apt to cause "bad arms" and severe constitutional disturbance.

Dr. McVail goes on to say that "nothing in the world is absolutely safe. A scratch of a pin may open

the door to erysipelas or lock-jaw, . . . and the vaccine vesicle may become infected septically or by erysipelas as in the case of any other wound. Such accidents, however rare, are most deplorable, and even if they are due to the fault of the incompetent or careless mother there cannot but be the deepest sympathy for her baby or herself." Incidentally, one wonders in what proportion of vaccination accidents the unfortunate mother can fairly be blamed, bearing in mind the conditions existing in poor homes? But I will let that pass. Dr. McVail might have mentioned to his hearers in this connexion a series of disasters which occurred in the State of New York a few years ago as a result of which it was decided by the State Legislature virtually to repeal the enactment which made universal vaccination compulsory.

Dr. McVail might properly have pointed out also that whilst the *proportion* of vaccinal injuries may be small, yet in the aggregate they are far from inconsiderable; and that now the risk of small-pox has been so enormously reduced the relative risks of vaccination and of small-pox may reasonably be compared. He might have mentioned that it frequently happens that the annual deaths resulting from the effects of vaccination actually exceed the deaths from small-pox. Indeed, if he takes the last 18 years, 1906–23, he will find that the deaths of unvaccinated persons from small-pox have been less than the deaths from vaccination. I think that this fact would have surprised some of his audience.

Just one more point before I conclude. Dr. McVail says, on p. 13: "In Britain, indeed, vaccination has never been 'compulsory.' Such a title is a misnomer. The Acts have never sanctioned a child being taken from its mother's arms and forcibly vaccinated." Surely, this is a verbal quibble hardly worthy of Dr. McVail! At one time vaccination was as "compulsory" as it was possible for a determined administration to make it so. In one city alone (Leicester) there were 1154 prosecutions in a single year (1881) and by the year 1886 the total number had mounted up to over 6000. Of the parents prosecuted 64 were imprisoned (after refusing to pay fines), 193 suffered distress warrants upon their goods, whilst a sum of £2388 was levied in fines and costs. If this was not "compulsion," what was?

Conclusion.

To summarise the chief of the above criticisms:—

1. In contending that small-pox is worth preventing it is quite irrelevant to cite the ravages of small-pox two centuries ago. However interesting historically, such facts have really no practical bearing upon the problems facing sanitarians to-day. In those remote times the principles of modern preventive medicine were neither understood nor practised.

2. The serious outbreak of small-pox in Poplar Workhouse last year, so far from being an argument in favour of infant vaccination, illustrates very remarkably one of the chief drawbacks to such vaccination—viz., its tendency to encourage the spread of small-pox by masking its true nature.

3. The statement that small-pox can be prevented by vaccination is true in the sense that vaccination has the power of producing temporary immunity to small-pox in the individual. But it has never been proved that small-pox can be prevented—i.e., effectually controlled—by any system of infant vaccination, however thorough. All the arguments adduced by Dr. McVail to substantiate this part of his case in reality only prove that vaccination produces temporary immunity in the individual.

4. It is very doubtful whether the statement that small-pox cannot, or could not, be prevented without vaccination is justifiable. The experience of this country during the past two decades, since modern methods of dealing with disease have been in vogue, certainly appears to point to the opposite conclusion.

Dr. H. H. Taylor, of Hove, has been placed on the Commission of the Peace for the borough.

CHANGING FACTORY CONDITIONS:

RISING STANDARDS AND FUTURE DEVELOPMENT.

I.

THE present Factory Act, which marked a great advance upon any of its predecessors, has now been in operation for over 20 years, and a good many changes have been effected under its powers. They have been 20 years, moreover, of remarkable developments in other directions, and they have witnessed the rise of voluntary agencies and of voluntary movements which are affecting profoundly industrial life. They would in any case have been years of unusual importance because they include the years of the war, which left a deep mark upon industrial life as upon every department of human life throughout the world. It is therefore suitable that some attempt should be made to review the changes which have taken place and to note present-day tendencies. This is the more important in view of the likelihood of the introduction of a new Factory Bill at no distant date.

The Rising Standard of Health.

The health of the workers, of some sections more directly than of others, has been an object of factory legislation from the time of that first modern industrial enactment, the Health and Morals of Apprentices Act 1802, passed six years after the Manchester Board of Health (a voluntary association) had called attention to the injurious effects on young children of work in the cotton mills. Regard for health was one of the main arguments for the limitation of hours in respect first of children and later of women and young persons; and limitation of hours was in effect the only measure proposed for many years. It was not until 1844 that the fencing of shafts and of gearing was required in the interests of the safety of workers; it was another 20 years before a Factory Act contained any provision as to sanitation and ventilation, and then the Act, that of 1864, only applied to certain trades which were considered to be specially unhealthy. The beginnings of control over sanitation are to be found in the Public Health Act of 1848, but it applied only to a few populous centres. The Public Health Act of 1866 gave a wider supervision. But it is worth noting that right up to 1901 there was no statutory provision as to general ventilation in factories, as distinguished from the removal of dust or fumes engendered in a process of manufacture. Nor to this day is there any general provision as to lighting.

Factory legislation has gone along two main lines; there has been a steady growth of provisions for general well-being, covering more and more conditions and extending to more and more categories of workers. And at the same time there has been special attention paid to unusual dangers to health or to safety, or to the necessity of protecting classes of workers most likely to suffer. Along these lines there has been substantial progress. It may be assumed that there will be in the future, as there has been in the past, need for both general and intensive study and for both general and special supervision of factory conditions.

The Dangerous Trades.

Legislation for trades especially dangerous to health dates back to 1864, when employers in them were given the power of making regulations for their workpeople, subject to the approval of the Home Office, and of enforcing them by fines, a measure which would meet to-day, it may be assumed, with most strenuous opposition. The making of regulations was transferred to the Home Office by the Factory Act of 1891, and the powers given then and increased in 1901 are the basis of the very complicated code of special regulations applying to dangerous trades to-day. The compulsory notification of industrial poisonings began in 1895, so that from that date we have fairly reliable statistics by which to gauge the

success of the regulations. The yearly returns form clear evidence of a substantial improvement, for whilst notifications are certainly not less complete than they used to be, and whilst the list of diseases notifiable has been extended, the number of cases shows a marked diminution in an increasing population. Phosphorus poisoning has practically disappeared; arsenic poisoning has been reduced to very small dimensions; and whilst the figures relating to mercury are not quite so satisfactory, they compare very favourably with pre-war years. Anthrax still remains a very serious danger, both here and abroad, and it is receiving careful consideration from the staff of the International Labour Office. Toxic jaundice, made notifiable in 1915, was almost entirely a war disease and it has disappeared with the war. As to the two industrial diseases recently made notifiable, chrome ulceration and epitheliomatous ulceration, it is too early to speak. But the poisonings already mentioned are, of course, all of them put together small in the total number of poisoning cases, of which a preponderating number still are, as in the past, due to lead. It is very satisfactory to note that the number of cases of lead poisoning notified has been reduced to something like a quarter of what it was in 1900. It is not the case, unfortunately, that the number of fatalities has diminished in the same proportion; there were 26 fatal cases in 1922 and 23 in 1921, as against 38 in 1900 and 31 in 1899. On looking into the detailed figures it is obvious that whilst in most of the industries employing lead it has been found possible to reduce immensely the amount of ill-health and the number of fatalities, in one particular industry—namely, the making of china and earthenware—there has been as yet no substantial reduction. There is also grave reason to be uneasy about the continued prevalence of lead poisoning among house painters and plumbers, who do not, however, come within the scope of the Factory Act.

Very wide powers are given to the Home Office under Section 79 of the Factory Act, and codes of regulations are in force in about 40 different trades, with yearly addition to the number. The commonest requirements are exhaust, or other special ventilation; the supply of protective clothing, which in many cases includes respirators; the provision of washing facilities, and in a few cases of baths; of cloak-rooms and of mess-rooms. Special attention to the cleanliness and good repair of floors is often required. Periodic medical examinations are ordered in some dozen trades. Women are excluded from a few processes,* young persons from a good many more.† In three cases work is only allowed on certain processes for short spells: they are the use of carbon-bi sulphide in the india-rubber industry, work in dry chambers and condensing flues in lead-smelting, and dipping and one or two other processes in pottery. It is worth noting that the limitation of hours applies to men as well as to women and young persons. Among regulations in different industries we have insistence on the provision of first-aid boxes where, as in work on chemicals or on horsehair, cuts and sores might easily be poisoned or infected; but, so far as health is concerned, the kinds of regulations mentioned cover substantially the field. They do, speaking broadly, enforce a special and detailed attention to hygiene in those trades where the penalties of neglect would inevitably be severe.

Welfare Orders.

In the stress of war, when the substitution of women for men and the urgent call for rapid production opened the eyes of many people to the need for conditions in the factories more favourable to health and to efficiency, there passed through Parliament, with little notice and practically no opposition, an Act with a curious title, the Police, Factories, &c. (Miscellaneous Provisions) Act, which gave new and far-reaching powers to the Home Office. For the first time they were able to prescribe conditions of welfare, as distinct from general safety and sanitation, even in the absence of any special danger; and there began to be built up for different industries a series of orders similar to those which had come into force during the past 25 years in the "dangerous trades." Welfare Orders have been made so far for about 15 trades. Provision of cloak-rooms and of mess-rooms, of protective clothing, and of first-aid boxes, are the most common requirements. In one or two industries—e.g., in fruit-preserving—seats must be provided, in some processes for all workers, in other processes for women only. For those who are engaged in the gutting of herrings there must be a rest-room. By one of the earliest orders under this Act there must be in *every*‡ factory a supply of drinking water.

Changes in Administration.

It is one thing to pass laws and to make regulations, and quite another thing to get them carried out. The changes in the administration of the law have been at least as important as the changes in the law itself. There is the increasing specialisation of the factory inspectorate, the doubling, for instance, of the medical staff since 1910, and the appointment of the first woman medical inspector in 1921. There has been an immense growth of coöperation between the factory inspectorate and the organisations of employers and of workers. In the annual report for 1922, Dr. J. C. Bridge records an interview with the officials of the Dyers' Union, Leicester, with regard to the Chrome Dyeing Welfare Order:

> "One of the main objects of the interview, as put forward by the officials, was that they wished to be in a position to explain to their members the use that should be made of the provisions of the Welfare Order. For this reason, he considered the interview very valuable, for one of the difficulties of administering the Welfare Orders is that the men fail to take advantage of the provisions made under them. An attitude such as that shown by this Union marks a very great advance."

Such an advance is being made in many quarters. If the briquette makers of South Wales, who are liable to pitch-cancer, are making any use of the baths provided, and are submitting to a periodical medical examination, it is due to the persistent advice given to them by their trade-union leaders. (In this particular case the regulations are merely by agreement of the Home Office with those engaged in the industry; they are not yet statutory.) It would be possible to cite many more instances of this kind. It means in many cases that the work done by the Joint Industrial Councils of some industries brings an intelligent and whole-hearted compliance with regulations which might otherwise be largely inoperative.

The Influence of the War on Welfare Work.

Welfare work, as distinct from statutory provision for welfare, had existed in a minority of factories for many years before the war, but it was the war which brought it into prominence, made it widespread, and gave to the welfare supervisors the status of a profession. The trade depression, as well as the relaxation of Government pressure, have produced a set-back, but there can be little doubt that it is only temporary or as to the far-reaching effects produced upon the health of the workers. It is in itself a very great thing for the women and girls to have a well-educated woman in a place of authority; she will attend to a hundred details, separately perhaps quite small matters but cumulatively of importance, which were neglected in the past because it was no one's special business to look after them. It may seem to some a trifle that there should be a woman responsible

* *Women* are excluded from casting brass, from some processes in the manufacture of electric accumulators, from smelting lead, the manufacture of paints and colours, and some processes connected with pottery.

† *Young persons* are excluded from the manufacture of chromates, some processes in the manufacture of electric accumulators, vitreous enamelling, use of non-disinfected horse-hair, fume processes and lead processes in the manufacture of rubber, smelting lead, dipping, and other processes connected with pottery, tinning of hollow ware, and heading dyed yarn.

‡ Unless it employs less than 25 persons.

for the proper condition of the sanitary conveniences, but those who have any knowledge of the habits of factory girls or of the evil effects of chronic constipation, will not think so. It is a matter of importance, too, that there should be someone on the look-out for marks of over-strain; that there should be a woman to whom the women can talk freely; and that there should be a rest-room where women and girls can go at those times when a short interval wisely spent can make such a difference. There are many other things which the welfare supervisors do which have a marked effect upon health; they are responsible for seeing that the workers can get a good meal at a reasonable price, and in comfort; they should arrange also for convenient means of transit where the workers come from a distance. There are also benefits, such as free dental treatment, given by some firms, but they are exceptional and probably they are likely to remain so; responsibility for the care of the teeth of its workpeople cannot be expected to fall normally upon a firm.

The Reduction of Hours.

The greatest of all the changes which have taken place in factory life in recent years has been the almost universal reduction of hours which took place in the months following the Armistice. In about six months six million workpeople had their normal weekly working hours reduced by an average of about six and a half hours per head. It was a very remarkable social phenomenon, this yielding without coercive legislation and without a bitter industrial struggle, of claims which had been vainly made and stoutly resisted for at least half a century. War-time experience had wrought a notable conversion of the employers. There had been a huge sale of the memoranda issued by the Health of Munition Workers Committee, and their findings had been written up in scores of newspapers and magazines. In December, 1918, in countless factories, great crowds were swarming through the gates at 6 A.M., to pour out again at 6 P.M., as they had done for decades past. By Easter 1919 this was exceptional.

Of all the conditions injurious to health from which our industrial workers have suffered the most common and one of the most serious has been continued overwork. On this point the final report of the Health of Munition Workers Committee was emphatic:—

> Apart from exceptional occupations which are in themselves injurious, the principal of the undesirable conditions, the most radical and persistent, the commonest is that of *long hours*.

Sir James Paget is quoted:—

> "You will find that fatigue has a larger share in the promotion or transmission of disease than any other single causal condition you can name."

At the same time as hours were shortened, there came in many cases automatically a curtailment also of the length of spells of work; and there has been a growing recognition of the value, strongly emphasised in the report just quoted, of rest-pauses. But spells of work are still in a good many cases excessively long.

Child Labour.

Another change amounting to a reform came by legal enactment and not without a certain amount of opposition: children disappeared at last from the factories. The injury done to boys and girls by premature work had been deplored and denounced a thousand times, and it had been greatly diminished by successive enactments. The Women, Young Persons, and Children Act of 1920 put an end to it, and within two years of its passing there was no longer a half-timer in our factories. We are still putting an excessive strain upon many of our adolescents, but that is another matter.

To sum up, there has been a steady raising of the standard of precautions in the dangerous trades, and the results are very evident in the statistics. There has been more recently a marked advance in the practices of a number of trades which, whilst not dangerous, have yet peculiar conditions. And there is a growing attention being paid, and a new scientific study being made, of the general conditions of welfare in the ordinary factory. More especially hours of work are much shorter than they were. Credit for the improvements is due partly to factory legislation and its administration, partly to voluntary agencies, and a changing public opinion. The results must be looked for in later years in the general health and mortality figures of different occupations and of the whole nation.

THE BRITISH EMPIRE LEPROSY RELIEF ASSOCIATION.

ON Jan. 31st a meeting was held at the Mansion House to open a campaign on behalf of the 300,000 lepers in the British Empire. The Lord Mayor presided. It is hoped to raise a fund of £250,000 for the purpose, and donations of £100 from the King and £100 from the Prince of Wales were announced. Messages were read from the Prince of Wales and from the Viceroy of India (Lord Reading).

Lord Chelmsford (chairman of the Association) outlined the situation that led up to the formation of the Association and emphasised the Imperial character of the latter. He urged business men to look upon the Association as a piece of health work for the Empire and to accord it the support it deserved.

Sir Humphry Rolleston said that leprosy, now very rarely seen in this country, was therefore apt to be out of mind; but as the greatest colonising Power in the world it was our obvious duty to set an example of preventive medicine. This country was now practically free from the disease, there being only one, a very small, though attractive, leper colony—that of St. Giles, near Chelmsford, which was in urgent need of funds; but it was once a very different story, for in the fifteenth century there were said to be 19,000 leper hospitals in Europe, including 2000 in France and 200 in England, and although many of the inmates were no doubt suffering from diseases erroneously regarded as leprosy, those figures gave some idea of its prevalence.

The Danger of Undetected Cases.

The unfortunate victims of this slow but hitherto remorselessly progressive disease became terribly mutilated and suffered both in body and in mind. In the dark ages they were pariahs; such isolation, no doubt in association with other factors, helped to diminish the spread of the disease, but the unhappy plight of recognised lepers had naturally always made them try to hide their disease. Even now this concealment was one of the great difficulties to be contended with in its prevention; in India, for example, although officially there were 102,000 lepers in 1921, there was reason to believe that there were at least as many more undetected. Leprosy was now known to be contagious and not hereditary, but the disease took years to develop after the seeds had been sown; the young were specially likely to contract it, so that an unrecognised case in a parent might infect the young family. Prevention was better than cure; in order to remove the natural dread of isolation from simple-minded and suspicious natives the conditions of segregation must be rendered attractive instead of repulsive, and leper colonies holding out pleasant, instead of prison-like, conditions of life must be provided. This was already being done in India, but only 8000 of the known 102,000 lepers were at present receiving help in this respect. Segregation alone was not enough to stamp out the disease; to detect the earliest stages and to test out the newest remedies required further research and therefore endowment. It was 50 years since Hansen published his discovery of the leprosy bacillus and this jubilee should surely be celebrated by its final disappearance. How was this to be effected? There appeared to be good reason to believe that Sir Leonard Rogers had found in the fatty acids of certain oils and in the preparation called

morrhuate of sodium a remedy that bade fair to be a final cure. Further work remained to be done; it was not always that the right man and the means for such success were available, and it was therefore obviously up to them to give him the full opportunity.

Development of the Use of Chaulmoogra Oil.

Sir Leonard Rogers briefly outlined the researches which enabled him to establish the important principle that by the injection of soluble products of the active portions of the old Indian remedy for leprosy, chaulmoogra oil, the bacillus of the disease could be destroyed within the body, with clearing up of all symptoms, as well as of the infectivity of the disease, and that similar preparations derived from cod-liver and other oils were also effective in leprosy. An American chemist in Honolulu later introduced a slightly different and more convenient product of chaulmoogra oil, which had now been used successfully for several years in various countries; the latest report from the Philippines of a trial of these various preparations in 1067 cases showed 56 per cent. improved, and in 36 per cent. more showed arrest of the disease, while where injections had been continued for the necessary periods of 6 to 9 months 74 per cent., and after 12 to 15 months no less than 93 per cent. of cases showed definite improvement, and a number had been completely cleared up. Numerous cures, in the very practical sense of restoration to health and working power, could now be obtained, while as some of his early cases had remained well for from six to eight years, there was good reason to believe that permanent cures could be established, an immense advance having already accrued in the treatment of this hitherto intractable disease.

Confidence of Natives in the Treatment.

To those who had had much experience of medical work in India and other tropical countries, he said, equally conclusive evidence was furnished by the fact that in many places numerous lepers were willingly submitting to weekly injections for many months, although such races would not continue a troublesome treatment unless absolutely convinced of its very beneficial effects. In leprosy, however, as in tubercle, much caution was necessary in speaking of a cure, and relapses had occurred due to not continuing the treatment for some time after the symptoms had disappeared. Nevertheless some of his earlier cases had remained well for six to eight years, so there was good reason to believe that permanent cures could be obtained, although, of course, lost fingers could not be replaced, and there was a definite limit to the efficacy of the treatment in long-standing and advanced cases, although photographs recently received show astonishing improvement even in some of the most advanced nodular cases. Apart altogether from the still incompletely settled question as to what proportion of lepers could be cured, to the important extent of losing all symptoms and infectivity and being restored to health and usefulness, the recent advances were rapidly removing the greatest obstacle to the reduction of leprosy by the segregation methods hitherto almost entirely depended on—namely, the impossibility of finding and isolating lepers in the early stages of their disease, before they had infected other members of their households.

Sir Leonard Rogers considered that from the point of view of the reduction and eventual eradication of leprosy from British possessions, an even more important outcome of the recent advance was already evident—namely, that for the first time in the 3000-year-old history of leprosy, large numbers of lepers were coming forward in the early and more amenable stages of the disease and the clearing up of their symptoms and infectivity was being accomplished in Calcutta in an out-patient clinic at low cost, before they had infected another generation of their households; thus there was a possibility of reducing the prevalence of the disease more rapidly than ever before, if only funds were forthcoming to bring the remedial measures medical science had at length furnished, within the reach of the 300,000 or more lepers in the British Empire, not more than one-fifth of whom could now be receiving the improved treatment, mainly on account of the poverty of India, tropical Africa, and others of our most affected possessions.

The Work of the Association.

The British Empire Leprosy Relief Association would work largely through existing agencies in distributing drugs, information regarding their use and the latest medical advances, by helping sound schemes of segregation combined with the latest treatment, training the staffs of leper institutions, and supporting research for still further improving the treatment, which fails to completely clear up many advanced cases; in short, to coördinate treatment and research throughout our scattered possessions. The recent advances were due to British and American investigators, but at present only the Americans were supplying their blessings to the great majority of their lepers in the United States, Hawaii, and the Philippines. As the 1923 Strasbourg International Leprosy Congress passed a unanimous resolution that all lepers segregated for the benefit of others ought to receive the best possible treatment, a moral obligation lay on Great Britain to fulfil this obviously just and urgent demand.

Mr. Frank Oldrieve (secretary of the Association) said that in India last year he saw more than 1100 lepers under the new treatments for the disease, and the majority were recovering. They might look forward to the Empire being practically free of leprosy within 30 years. Three points were to be stressed: (1) Segregation was effective in reducing the incidence of the disease; (2) leprosy was not hereditary; (3) leprosy was now curable. There was only the present generation of lepers to be dealt with. This was the most hopeful of all campaigns, for they were on sure ground and definitely knew what to do.

Sir Sydney Olivier, in moving a vote of thanks to the Lord Mayor, compared the discovery of the new treatment of leprosy to the establishment of the sources of infection in malaria and yellow fever. As Secretary of State for India he ventured to point out to his Indian friends, who had a large body of very able medical men, that they had an enormous opportunity, which had only recently been opened out to them.

NOTES ON THE FRENCH MILITARY HEALTH SERVICES.

(FROM OUR OWN CORRESPONDENT.)

THE French military health services are passing through a period of crisis which has arisen since the war and is due to the diminution of its personnel. The recruitment of French military doctors has, in the past, been carried out through two channels. (1) The first was the special Army Medical School at Lyons, to which admission was gained on a competitive basis. The course consisted of four years' study, and the same medical programme was followed as for the civil students at the Faculty of Medicine of Lyons, except that military discipline was enforced in the school. On qualifying, graduates were sent to the Val-de-Grâce, Paris, for a year's study of medicine in its application to the military health services. (2) The second channel was direct entry to the Val-de-Grâce by competition, open to doctors who had taken medical degrees elsewhere than at the Lyons School. On entering the army, the military doctor attained the rank and prestige of a combatant officer. Before the war these conditions were eminently satisfactory, competition was keen, and the best type of efficient army doctor was obtained, but at the present time the situation is completely changed. Pay has not risen in proportion to the cost of living, and the course of study required is long and costly. As six years are required in preparation, the army doctor, even if he starts his studies at an early age, cannot hope to commence his career before the age

of 25, while combatant officers from Saint Cyr or other military academies may attain a rank equivalent to his own at 20, after two years of study. And, on the other hand, a comparison with a medical man's prospects in civil life shows that the civil doctor's income at least bears some relation to the fluctuation of prices. The result has been that a considerable number of military doctors have left the service, and fresh recruits are not forthcoming. At a recent competitive examination at Lyons there were only half as many candidates as there were posts to fill. Such has been the experience every year since the war.

The Army Parliamentary Commission, realising the inadequacy of the pre-war system under present conditions, has abandoned the scheme of regimental service whereby one doctor was attached to one unit, and has instituted a medico-chirurgical service for each town, thus placing one medical officer in charge of several units. But it is too much to expect that one army doctor, however conscientious he may be, can alone give wholly adequate attention to several and perhaps widely separated units. Further, the doctor, in collaboration with the regimental commanders, played an indispensable rôle in dealing with all questions of hygiene, and it is now feared that his widened sphere will cause dilution of his influence, and the medical aspect of the army service will be weakened. In a country like ours, where military service is compulsory, everyone should have the right to adequate medical attention while in the army.

To meet the present crisis recourse has been had to civil doctors, who have been offered appointments at the various centres. But that is only a half measure, and cannot be more than temporary. The army needs permanent advisers on all health matters, who by their intimate and specialised knowledge of army conditions can maintain the highest standard of physical efficiency among the troops. In order to attract medical men to the army, and to retain those who are already in service, it has been proposed to add a substantial monthly bonus to the present rates of pay. It is to be hoped that this proposal will be carried into effect as soon as possible, in order to avert any further dissatisfaction.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

A Surgical Lecture on "Dichotomy."

ONE must go back very far in the history of the medical profession to encounter an incident similar to that which happened a short time ago when Prof. Dr. Hochenegg, the well-known chief of the first surgical clinic of the Vienna University, launched a deliberate attack on the ethical standard of the Vienna doctors. In the course of a lecture, held before his regular audience of students, the professor declared that one of the most important principles of medical art was the correct indication for operations, and he was forced to state that in this respect the medical profession of Vienna was lacking in an unbiased consideration of deciding factors. He possessed proofs, he said, that monetary considerations were of paramount influence in deciding whether surgical interference be advised or carried out in the case of any particular patient. The disgraceful custom of "dichotomy"—splitting the fee between the family practitioner and the consultant or surgeon—had become lately so widespread and so widely accepted that those few upright men who refused to be a party to such proceedings were simply shut out from consultative work, and their practices, like his own, had dwindled away. Consultants who employed "agents" at a commission varying from 30 to 50 per cent. were flourishing and were praised as masters of their profession, while those who would not countenance "dichotomy" were held to be incompetent, antiquated, and incapable of doing any modern surgery. This disgrace Prof. Hochenegg would not tolerate any longer, and as he too had been the victim of rumours of having become quite unfit for surgical work, he exposed the intrigue to his students and also took care to communicate his lecture to the press. Needless to say, when the article appeared in the papers it caused a great outcry both amongst the profession and the general public. The Medical Council and the Economic Organisation both held protest meetings against the insinuations contained in the lecture. The professor was asked to show his proofs, and to state the names of the men who had acted in this shameful manner, otherwise he would be prosecuted for slander. The professor at first refused to hand over the material of his lecture to the authorities, but at last he was forced to give in, and within a fortnight he will have to sustain his attack on the profession with definite figures and names.

The First Year of Cremation in Vienna.

The first report of the Cremation Institute of Vienna was published recently, and it is very interesting to note that in spite of both open and secret opposition it could not only hold its own but even contribute to the finances of the municipality. Whilst at first the Government, whose leader is a Roman Catholic priest, was most violently opposed to the idea and tried to prevent the erection of the institute by every means at its disposal, it now limits its antagonistic attitude to a passive resistance. But the priesthood of both the Catholic and the Jewish creeds are openly hostile still, and refuse the religious ritual at the burial of a cremated body. Nevertheless, in the first month of last year, when the institute was opened, 30 cremations took place, and the number increased monthly until in December it reached the figure of 89. Altogether 834 corpses were cremated (519 males, 315 females). As regards religion, 517 were Catholics, 124 Evangelic, 95 Jewish, and the remainder were undefined. The original calculations were based on an average monthly record of 50 cremations, those actually effected constitute 5 per cent. of all burials in Vienna. If, however, we consider that a large number of burials take place at the expense of the municipality as "poor" burials, we find that nearly 10 per cent. of all burials paid for are cremations. The capital invested in that institute brings an interest at the rate of 25 per cent. per annum.

Medical Certificates of Exemption.

Physicians are often requested by their patients to supply a certificate stating that the patient is unable to attend school or to fulfil certain duties—e.g., as a witness in court, &c. This "desire to be ill" is often so pressing that the doctor complies with the patient's wish and provides a certificate in which the reasons for exemption are very often only an exaggeration of trivial symptoms. In a memorandum to the profession the Medical Council issues a warning to doctors with regard to this practice. The Austrian law does not at present deem such conduct to be illegal, but under the proposed new Medical Act the doctor would incur the danger of being charged with fraud if he were to give a wrong statement "knowingly." If the statement is used to obtain any material advantage—damages for an injury or free treatment under the "War Invalid's Act"—the doctor may be sued for damages by the second party wrongly charged. The minimum danger for the doctor would be of arraignment before the Medical Council for breach of the ethical code.

UNIVERSITY OF MANCHESTER.—A bronze bust of Prof. Harold B. Dixon, who occupied the chair of chemistry at the University from 1886 to 1922, was unveiled on Feb. 1st in the chemical theatre of the University by one of Prof. Dixon's earlier pupils, Dr. Harold G. Colman. Prof. Dixon said that it had been his ambition to complete the work of his predecessors, Frankland and Roscoe, and to secure facilities of research. Thirty-six years ago the facilities for research were practically confined to the big German laboratories. Our industries require recruits with training in methods of research, and the memorial he had striven for was the reputation of the laboratory of the University as a school of research. Individual subscribers to the Dixon memorial number 240, and the sum subscribed was £550, of which about £500 would be available for the bursary which it was proposed to found in honour of Prof. Dixon.

Correspondence.

"Audi alteram partem."

A NEW TECHNIQUE IN RADIUM THERAPY.

To the Editor of THE LANCET.

SIR,—From the nature of the radiations emitted by the later disintegration products of radium it was thought that preparations of these later products alone, and without any of the more active members of the series, might have a specific action on superficial lesions. It has been found possible to prepare quite suitable applicators, and initial clinical experiment has so confirmed the expectation that we desire to make this preliminary notice of the work.

The diseases which have so far been treated with these preparations are: superficial nævus of the telangiectatic type and lupus erythematosus. Within a short time a very definite reaction has resulted with each disease. Part of an extensive superficial nævus showed marked improvement within ten days, with final pallor over the area of application. In a very intractable case of lupus erythematosus the reaction was most pronounced, and an apparently healthy area of natural colour was produced.

The results so far obtained are very encouraging, and work is being continued both on the methods of extraction of the particular active material and on the therapeutic use of such preparations. It is hoped to publish at a later date full details of the processes involved, and of all the clinical results.

We are, Sir, yours faithfully,

W. HERBERT BROWN, M.D.,
Dermatologist to the Victoria Infirmary, Glasgow;
JOHN P. MCHUTCHISON, B.Sc., M.A.,
Physical Chemist to the Glasgow and West of Scotland Radium Committee.
University of Glasgow, Jan. 23rd, 1924.

*** The collection of emanation residues is a matter of no little economic interest.—ED. L.

AIR NAVIGATION AND THE SCOPE OF PREVENTIVE MEDICINE.

To the Editor of THE LANCET.

SIR,—Travel has ever been a potent factor in disease propagation; a perusal of the history of medicine bears graphic witness to this fact. The Black Death which ruthlessly traversed the trade routes of the world in the Middle Ages might well be instanced; or, again, the cholera epidemics of 1817, 1826, and 1891, with India as their starting-point. To cite a recent example, the outbreak of small-pox in London in October, 1923, was traced to a woman traveller from Valencia in southern Spain. These are but isolated examples, chosen from memory and with due regard for brevity. It is of interest to speculate in regard to the spread of disease by air travel, and the measures which might be found necessary for the effective prevention thereof.

Some 20 years ago, the first power-aeroplane was flown for 12 seconds by Wright in America. To-day our aeroplanes have attained a speed of 250 m.p.h., have flown to a height of seven miles, and have remained in the air for a continuous period of 36 hours. Future progress may be as rapid. At the Imperial Conference held in London, October, 1923, the Air Minister stated that in the past three years our cross-channel air service had met with no serious accident, although 2,000,000 miles had been flown. The number of passengers was steadily increasing. Sir Samuel Hoare then proceeded to explain the Burney scheme to the Conference. This scheme proposes the opening up in the near future of an airship service between this country and India. The French Air Ministry has recently promised financial support to the proposed inauguration of an airway between Paris and Buenos Ayres. The International Air Navigation Commission, with headquarters in Paris, is at work preparing schemes, conventions, and maps, in the confident anticipation of the early establishment of these and other great airways.

In connexion with the International Commission a special medical subcommission has been duly set up, to deal presumably with the momentous medical problems which generalised air travel will bring to light. The work of such a subcommission should proceed principally along the channels of preventive medicine, so as to organise a line of defence against importation of disease through the medium of air travel. The vigilance practised by sanitary authorities at our seaports will require to be exercised in even greater degree at the great airports of the future. The danger of the propagation of disease by air travel is real. Cholera, for example, is a disease whose rate of spread coincides faithfully with the speed of human travel. Epidemics of this disease select India as their usual starting-point. Now an airway to India (as outlined in the Burney scheme) would allow of the completion of a journey in five days that now occupies 15 days. Again, travellers by air will complete long journeys within the limits of the incubation periods of certain infectious diseases which at present manifest themselves during the sea-voyage. Disposal of excreta on board airships may present difficulties. In the case of shipping Nature provides an effective means of disposal. In the case of aircraft performing long journeys a conservancy system will have to be devised.

The medical problems arising out of popularised air travel will constitute a new branch of public health work. Work of such a civil air medical service might comprise, inter alia, the medical inspection of all travellers by air on embarkation and disembarkation; the rigorous medical examination of all intending pilots or crew of aircraft; the periodical re-examination of such pilots and crew; the direction of sewage disposal; the periodical fumigation of large aircraft; the maintenance of adequate medical equipment on board aircraft. Many other duties could devolve upon such a service.

I am, Sir, yours faithfully,

ARTHUR MASSEY, M.B., Ch.B., D.P.H.,
Jan. 31st, 1924. Asst. M.O.H., Southampton.

THE "ELECTRONIC REACTIONS" OF ABRAMS (E.R.A.).

To the Editor of THE LANCET.

SIR,—There are at present only a few medical men in London who have faith in the E.R.A., and many others who have followed the articles in the American journals have more than a shade of scepticism.

The able article in THE LANCET of Jan. 26th by Dr. Howard Humphris, and the leading article in the *British Medical Journal* of the same date, have increased the number of sceptics. Everyone would welcome a real test of the diagnostic power of the Abrams machine and its modifications, leaving the question of treatment out of the inquiry, as many conditions are benefited by suggestion, and suggestion acts more powerfully when it is directed by means of some appliance not understood by the patient. The test I would suggest is that three of the exponents of this cult be selected to meet a like number of medical men chosen by yourself. The blood should be taken from each of the three "controls" (or ought I to say mediums?) of the followers of Abrams, and these specimens should be shuffled in with specimens of blood taken from patients with known and well-recognised diseases. These E.R.A. practitioners should report on the series of bloods, not knowing their sources, when, as their "controls" are presumed to be fairly healthy, the results might be interesting.

I am, Sir, yours faithfully,

BRUCE BRUCE-PORTER.
Grosvenor-street, W., Feb. 4th, 1924.

THE EXPLOITATION OF NURSES.

To the Editor of THE LANCET.

SIR,—A protest should be made against an apparent exploitation by the General Nursing Council of the mute, but not inglorious, army of women who are entering the nursing profession. At present a trained nurse has to pay a registration fee of one guinea and an annual half-crown to keep her name on the register. Now, it is proposed to charge impecunious girls a fee of five guineas for the examination which, if they pass, will enable them to be registered. I suppose this fee is to pay the expenses of the examination and the fees of the examiners. It is an extravagant charge and, in my opinion, ought to leave a considerable balance in the hands of the examining body. If so, the council ought to state their object in extracting this surplus money from a hard-worked and underpaid body of women. Is there some project to raise a fund to erect a college of nursing for the accommodation and aggrandisement of this important council? If this be the case, the women who are paying these fees should have some voice in the matter.

Much to the amusement of the medical profession, the council has issued an astounding syllabus of the medical knowledge to be acquired by nurses. It is so extensive that only the most highly intelligent women will be able to acquire more than a smattering of each subject, with the result that the confusion between medical and nursing knowledge will be at a maximum. And, in order to acquire this hotch-potch of knowledge, these girls will have to attend numerous lectures and study during their hours of leisure, although physically fatigued by the nature of their work. Or else the time spent on lectures, &c., will have to be included as part of their day's work, at the expense of the much more valuable practical training. The standard of most of the girls entering the nursing profession is neither socially nor intellectually as high as in former days. In my experience the slight improvement during the last two years is falling off. Consequently these girls are even less likely to absorb the excessive book knowledge which is aimed at. Moreover, it is not knowledge of this sort which produces the most capable nurses. The best ward sisters and nurses are by no means always those who have shone in the examination room.

If this pseudo-scientific examination is conducted so as to maintain a fairly high standard, it means the rejection of a certain number of reasonably capable nurses, possibly 20–30 per cent. Surely, this will prevent girls taking up this profession: three years' training, hard physical and mental work, a minimum salary, and possible rejection at the end. On the other hand, if the standard adopted is that in vogue at the various hospitals, where few fail to reach the standard deemed necessary for practising as a nurse, I see no necessity for a five guinea examination, unless it is a measure for obtaining money from these impecunious girls for some such purpose as above suggested.

Let me propose to the General Nursing Council that this scheme be dropped. It is ridiculous. If they wish to create a more highly qualified type of nurse, let them introduce a voluntary examination and give a special certificate or a diploma of nursing, and allow the rest of the nurses to be examined as at present. This might result in the development of two grades of nurses, one of which would be able to demand and would deserve higher fees, while the other will supply the public with the kind of nurse it often wants. Does the council suppose that raising the standard to an unduly high level is going to provide the type of nurse who will be content to nurse trivial and chronic cases, although these form the bulk of the cases in general practice?

I am, Sir, yours faithfully,

EDMUND CAUTLEY.

Park-street, W., Feb. 1st, 1924.

MEMORIAL TO THE LATE PROF. ASHLEY CUMMINS.

To the Editor of THE LANCET.

SIR,—The many friends and former students of the late Dr. W. Ashley Cummins, professor of the practice of medicine at University College, Cork, will learn with a sense of the keenest satisfaction that a project of providing a permanent tribute to his memory has been initiated.

It is thought that no more fitting memorial could be chosen than the endowment of a bed in the Victoria Hospital, to which Dr. Cummins devoted so much of his professional life. Those who knew Dr. Cummins will realise instinctively that he himself would have wished no other tribute to his memory than that his name should be associated for all time with the beneficent work of the hospital in which he took a keen and life-long interest, and of which his father was one of the founders.

Graduates of University College, Cork, who were associates or pupils of the late Prof. Cummins, and other members of the profession who feel so disposed, are invited to coöperate and to send donations to one of the signatories of this letter.

We are, Sir, yours faithfully,

C. B. PEARSON,
1, Sidney-place, Cork.

MICHAEL CAGNEY,
13, St. Patrick's-place, Cork.

Jan. 29th, 1924.

A CORRECTION.

Re REVIEW OF "EMERGENCY OPERATIONS FOR GENERAL PRACTITIONERS."

To the Editor of THE LANCET.

SIR,—I shall be glad if you will allow me to correct a series of singularly unfortunate errors and inaccuracies which appeared in a so-called "review" in THE LANCET of Jan. 26th regarding a new book of mine, entitled "Emergency Operations for General Practitioners on Land and Sea." After perusal of the somewhat imposing array of these inaccuracies, as enumerated below, I think it will be clear to you and to your readers that no worth can be attached to such a review, and that in fairness to author and publisher alike there should be an open acknowledgment of these incorrect statements:—

1. *The title* is incompletely given. This should have read "Emergency Operations for General Practitioners on *Land and Sea*." The latter part was quite omitted.

2. *The size* of the book was not stated. This should have been given as demy 8vo.

3. The number of printed pages contained in the book was most incorrectly stated as 1065, whereas the actual number is xii. + 135.

4. No mention is made regarding one of the chief features of the book—viz., the illustrations, of which there are 67, all original.

5. *The price* of the book is unfortunately as well as incorrectly stated to be 15*s.* instead of 7*s.* 6*d.*

6. Your reviewer has made misleading statements when he says, "Instructions how to find the cæcum in an appendix operation, and where to look for a perforated gastric ulcer, have been omitted." Now no one objects to a fair criticism of a published work, but inaccurate statements call for comment and correction. Had your reviewer made more than a superficial scanning of my book he would have found that the information he declares "missing" appears on pp. 33–34, and 30 respectively.

7. Again, there is an observation regarding strangulated hernia, that certain diagnostic points are absent. Had he carefully perused the preface, he would have noted that it is clearly pointed out that "questions regarding diagnosis are not entered into nor considered in this small volume."

8. Another of your reviewer's inaccuracies appears regarding "Intra-abdominal hæmorrhage." Arrest

f hæmorrhage in general is dealt with on pp. 115–122, hilst hæmorrhage from gastric and duodenal ulcers ppears on pp. 29–30. The absence of *rare* operations beyond criticism, as such absences are alluded to in general way in the preface.

9. Another incorrect statement is contained in the marks regarding end-to-end anastomosis, where it is aid that "no account of the operation is given." erhaps your reviewer will note that gastro-intestinal nastomosing and intestinal suturing are not only escribed, but both are fully illustrated by actual hotographs of the procedure, the former on p. 27 nd the latter on p. 75.

Bearing in mind, therefore, the complete series of istakes and incorrect statements as above shown, will be fairly obvious that the very dogmatic umming up of the book in question, as is contained in he closing sentence of this review, is as unjust as it is nmerited, and likely to ruin the sale of the book, ith consequent loss both to myself and to my ublishers.—I am, Sir, yours faithfully,

Newcastle-on-Tyne, Feb. 2nd, 1924. H. C. ORRIN.

*** We regret that in a review of "Emergency perations for General Practitioners on Land and ea, An Illustrated Manual of Procedure and Techique," by Mr. H. C. Orrin, surgeon to the Ministry of ensions Orthopædic Hospital, Newcastle-on-Tyne, he number of pages and price of the book were stated rongly through confusion with another volume. Ve have been unable to find in the book a statement f the price. The book contains 135 pages, including ndex, and is published at 7*s.* 6*d.*, the advertisement hich appeared in our issue of Jan. 19th being orrect. The book was reviewed under the title Emergency Operations for General Practitioners," he style which appears on the cover. We have rronged Mr. Orrin, and are happy to say so and to ublish his letter. This arrived when THE LANCET as at press, so that no opportunity arose to invite he reviewer to withdraw any statements, or opinions, r to qualify them in this issue. But inspection of the ook makes it clear that we are dealing here with ifferences of opinion and interpretation of words ather than with facts. A suggestion which reaches us. ot from Mr. Orrin, must be mentioned to be repudited. It is that the reviewer has taken cowardly dvantage of anonymity. Reviews in THE LANCET re not signed, and the charge of dishonesty must be net by ourselves with a denial.—ED. L.

INSTITUTIONAL MEDICAL OFFICERS AND INCOME-TAX ASSESSMENT.

To the Editor of THE LANCET.

SIR,—The Medical Defence Union has recently btained from the Special Commissioners of Income ax a decision which the Council of the Union feels s of such importance as to merit publication in the nedical press.

A member of the Medical Defence Union, who was he medical superintendent of one of the Metroolitan Asylums Board's Hospitals, by virtue of his ffice occupied a separate house in the grounds of he hospital rent free. The local inspector of taxes ought to assess our member upon the rateable alue of this house, treating it as an emolument of is office. The Union was accordingly consulted in he matter, and an appeal was lodged against this ssessment with the Special Commissioners. The ecision of the Commissioners has now been obtained, o the effect that the beneficiary occupation of a ouse in circumstances such as these is not an emolument within the meaning of the Finance Acts, and he assessment has therefore been discharged.

As there must be many medical men similarly laced, it is felt that the decision thus obtained ught to be made known in their interests.

I am, Sir, yours faithfully,

JAMES NEAL,
General Secretary, Medical Defence Union,
49, Bedford-square, London, W.C. 1, Feb. 5th, 1924.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

C. Godfrey to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

The undermentioned retire on ret. pay.

Majs. Robert J. Cahill (granted the rank of Lt.-Col.) and E. C. Whitehead.

The undermentioned Lts. are confirmed in their rank: W. B. F. Orr, F. J. O'Meara, and T. W. Davidson.

ARMY DENTAL CORPS.

Capt. J. C. Wood, late Spec. List., to be Capt.

INDIAN MEDICAL SERVICE.

Lt.-Col. R. A. Needham to be Brevet Colonel.

The King has approved the retirement of Lt.-Cols. P. St. C. More and E. M. Illington.

Mohan Singh Segat, Rajindar Singh Sandhu, and Achanvittil Krishna Menon to be Temp. Lts.

Lt.-Col. G. Tate's tenure of office as an elected member of the Punjab Medical Council expires on Feb. 24th, and the election of his successor is at present under consideration. Col. R. Heard, Inspector-General of Civil Hospitals, and Lt.-Col. W. C. H. Foster, Director of Public Health, have been appointed Members of the Punjab Legislative Council. Maj.-Gen. Benjamin H. Dare has been appointed a member of the Bengal Legislative Council. Col. Hugh Ainsworth has been appointed a Member of the Bihar and Orissa Legislative Council. Lt.-Col. H. G. Hutchinson has been granted eight months' leave.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—An ordinary Comitia of the College was held on Jan. 31st, the chair being taken by Sir Humphry D. Rolleston, the President.—The following candidates were admitted to the Membership of the College: Drs. C. W. C. Bain, J. Bamforth, V. J. Bonavia, A. J. Cronin, B. Day, R. Hale-White, C. G. Imrie, J. H. Kelly, D. Pottinger, B. H. Spilsbury, A. Stokes, H. M. Turnbull, C. H. Whittle, and B. B. Yodh.—Licences to practise physic were granted to 198 candidates (including 32 women) who have passed the Final Examination in Medicine, Surgery, and Midwifery of the Conjoint Board, and have complied with the by-laws of the College. The following are the names and medical schools of the successful candidates:—

Robert D. Alexander, Cambridge and St. Thomas's; Cyril F. Ashby, St. Bart.'s; Joseph Atkin, Guy's; Naguib Fauzi Azer, Cairo and Charing Cross; Robert C. Baxter, Charing Cross; Harold P. Baylis, Guy's; John Bee, London; Edgar R. Bennion, Westminster; *Muriel E. Binns, Royal Free; Charles E. W. Bower, Manchester; Michael Angelo Boneventure Brito-Mutunayagam, Ceylon and St. Thomas's; William Brockbank, Cambridge and Manchester; Ronald W. Brookfield, Liverpool; Walter G. S. Brown, Cambridge and St. Bart.'s; Richard E. D. Cargill, Oxford and St. Bart.'s; Herbert D. Chalke, Cardiff and St. Bart.'s; James H. H. Chataway, Manitoba and St. Bart.'s; *Nora Cheney, King's College; Richard Chester, Leeds; William Clark, Charing Cross; George D. Clarke, Hyderabad and London; Robert G. Cochrane, Glasgow and St. Bart.'s; Thomas S. Cochrane, St. Bart.'s; Peter S. Conman, King's Coll.; Alexander M. Cooke, Oxford and St. Thomas's; *Rosemary Cooke, Cambridge and Charing Cross; Samuel S. Cruden, St. Bart.'s; Desmond E. Cuffey, Cambridge and King's Coll.; Edward R. Cullinan, St. Bart.'s; *Vera Cullwick, Birmingham; Charles H. C. Dalton, Cambridge and St. Bart.'s; Alfred F. D. Darlington, Cambridge and St. Thomas's; Arthur B. Davies, Guy's; John H. T. Davies and Phillip O. Davies, Cambridge and St. Bart.'s; Trevor Davies, St. Bart.'s; *Dorothy L. C. Day, London; Arthur M. Deane, St. Thomas's; John S. Dees, Bombay and Middlesex; Alexander de Souza, Cambridge and Middlesex; *Miriam P. de Villiers, Cape and Royal Free; George P. Driver, Manchester and St. Bart.'s; Wilfrid H. Dunn, St. Thomas's; *Winifred P. Edmunds, King's Coll.; *Barbara J. Edwards, Birmingham; John Elgood and Gilbert Elliot, St. Bart.'s; Vernon H. Ellis, London; Alfred C. M. Elman and Edwin S. Etheridge, Univ. Coll.; Daniel M. B. Evans, Cardiff and Charing Cross; Thomas J. Evans, Cardiff and Middlesex; Edward K. A. Firth, Edinburgh and St. Thomas's; Hubert H. Fisher, St. Bart.'s; Theodore F. Fox, Cambridge and London; Edgar S. Frischmann, Manchester; Maurice W. M. Gadrat, Paris; Philip Garson, St. Bart.'s; William H. George, Cardiff and London; Herbert M. Golding, Bristol; Horace P. Goldsmith, Univ. Coll.;

Wilfrid Gough and Frank E. Gould, Birmingham; Arthur W. Grace, Univ. Coll.; Hellmuth Graf, Liverpool; Francis H. K. Green, St. Bart.'s; Charles W. Greenway, Guy's; Robert J. Gregory, St. George's; Walter E. Grice, Middlesex; Arthur B. Griffiths, Liverpool; Griffith J. Griffiths, Middlesex; Reginald D. Gross, Guy's; Stanley A. Gunter, St. Bart.'s; John A. E. M. Hadley and Leslie W. Hale, Univ. Coll.; Charles S. Hallpike, Guy's; John G. Hamilton, London; Ivor E. Harries, Guy's; Kenneth E. Harris, Cambridge and Univ. Coll.; Arnold W. Hart-Perry St. Bart.'s; Rowland C. Hatcher, Bristol; *Leila M. Hawksley, Royal Free; Linley I. Henzell, Univ. Coll.; James C. W. Hewetson, Guy's; Ernest W. Hicks, St. Thomas's; Henry A. Hirst, London; James A. Hislop, Durham; Stanley A. Holford, Middlesex; John Holmes, Cambridge and St. Bart.'s; Arnold Hooper, Leeds; *Gwynedd Hugh-Jones and *Kathleen M. Hyslop, Royal Free; *Ethel J. Isaacs, Westminster; Harry Jaffe, Manchester; Thomas G. I. James, Cardiff; John W. W. Jepps, Cambridge and St. George's; Alan T. Jones, Cardiff and Univ. Coll.; William Jones, Univ. Coll.; Patrick C. Joscelyne, Bristol; Abdelaziz Abul Khair, St. Bart.'s; Edgar F. King, Bristol; Stanley W. M. King, Sydney and St. Bart.'s; *Charlotte A. Kingdon, Royal Free and St. Mary's; Frank Langford, Bristol; Arthur L. Lankester, Cambridge and St. Thomas's; Noel E. Laurence, St. Bart.'s; David E. Lawrence, Cardiff and St. Bart.'s; Harold B. L. Levy, Durham; *Geraldine N. Longford, St. Mary's; Gordon Lucas, London; *Kathleen M. Lyons, Univ. Coll.; Robert R. Macintosh and Norman W. MacKeith, Guy's; John R. A. Madgwick, London; *Doris I. Mart, Univ. Coll.; *Lucy M. T. Masterman, Royal Free and St. Mary's; Mendel Meyers, Cape and St. Bart.'s; Henry S. Morley, Univ. Coll.; Samuel W. H. Moul, Calcutta and Charing Cross; Raymond T. Mummery, Cambridge and St. Mary's; Carriappa Appayya Nadicarianda, Bombay and London; Bhagwant Singh Nat, St. Andrews; Eric E. Neser, Cape and Guy's; John W. Newbold, Bombay and Univ. Coll.; Isaac Newton, Charing Cross; Charles P. O'Brien, Bombay and St. Bart.'s; Frederick W. Oldershaw, London; Robert D. Owen, Cardiff and Guy's; Robert Owen-Jones, Middlesex; *Lucy Parker, Royal Free; Griffith W. V. Parry, Cardiff and Guy's; Thomas G. W. Parry and William F. Payne, Guy's; Philip R. Peacock, Middlesex; *Betsey Porter, Liverpool and Royal Free; *Louisa M. Poynder, Bombay and Charing Cross; Trevor M. Preece, Cambridge and St. Bart.'s; Eric A. B. Pritchard, Cambridge and Univ. Coll.; *Evelyn R. Pyke and Alfred J. Reed, London; *Laura M. Rhodes, Royal Free and St. Mary's; Richard L. Rhodes, Cambridge and St. Bart.'s; Oliver F. W. Robinson, Belfast and King's Coll.; Morris Rockfelt, Univ. Coll.; Ernest J. H. Roth, St. Bart.'s; Stanley C. Rowbotham and Max Rubinstein, Guy's; Edgar Rudge, Cambridge and St. Bart.'s; Robert W. Savage, St. Bart.'s; *Margaret B. Savory, Univ. Coll.; Robert W. Scarff, Middlesex; Francis L. Scott, King's Coll.; Eric C. Seward, Guy's; Christopher J. L. Sharp, Cambridge and London; Hubert Sheard, Leeds; Julius Silver, Middlesex; Francis A. H. Simmonds, Cambridge and St. Bart.'s; Alan S. Simpson and Arthur E. Slinger, King's Coll.; Gerald F. Smith, Middlesex; Nathan Smith, Cape and St. Bart.'s; James A. Smorfitt, Leeds; *Beatrice M. Smyth, Cambridge and London; Samuel Snelson, Manchester; Walter R. Spurrell, Guy's; Reginald H. Stanbridge, London; Richard S. Starkey, Cambridge and St. Thomas's; Eric G. Steeler, St. George's; William Stephenson, Durham; Joseph D. M. Stewart, Cambridge and St. Bart.'s; *Viva Eileen K. Stuart, Royal Free and St. Mary's; *Edith C. Summerskill, Charing Cross; Harish Chandar Suri, London; Hugh H. D. Sutherland, St. Bart.'s; Thomas R. Sutherland, Cambridge and St. Bart.'s; *Annie D. Symons, Royal Free; Alan K. Thomas, Univ. Coll.; William E. C. Thomas, Cardiff; Kenneth W. Thorp, Cambridge and St. Thomas's; Robert W. H. Tincker, St. Bart.'s; Horace S. Townsend, King's Coll.; Bernard D. Underwood, London; Hubert C. Van Dort, Ceylon and Middlesex; Douglas C. Vaughan, Manchester; Harold F. Walker, Middlesex; Sidney A. Walker, Liverpool; *Dorothy A. Waterfield, London; Edmund R. Weaver-Adams, Cambridge and St. Thomas's; *Elizabeth N. Wells, Charing Cross; Henry J. W. J. Westlake, Guy's; Henry A. M. Whitby and Harold B. White, St. Bart.'s; *Fanny M. Whittaker, Charing Cross; George William Wigg, Durham; *Cicely F. Wilson, Bristol; Albert W. Wood, Birmingham; *Constance A. P. Wood, King's Coll.; and Stanley C. H. Worseldine, Guy's.

* Under the Medical Act, 1876.

Diplomas in the undermentioned subjects were granted, jointly with the Royal College of Surgeons of England, to the following candidates:—

DIPLOMA IN PUBLIC HEALTH.

Ephraim Benjamin, Bombay and King's Coll.; Florence Bentham, St. Mary's and King's Coll.; Mohan Lal Bery, Manchester; Frederick J. Darbyshire, Westminster and Roy. Inst. Public Health; May C. Ferguson, N.U.I. Dublin and Roy. Inst. Public Health; Jitendra Mohan Ghosh, Calcutta and Univ. Coll.; Madhao Ramrao Goverdhan, Bombay and Roy. Inst. Public Health; Eleanor Harse, Royal Free and Univ. Coll.; Ernest C. Holtom, R.N. Haslar and Univ. Coll.; Ivor Lewis, Univ. Coll.; Reginald C. Lightwood, King's Coll.; William S. McGillivray, Aberdeen and Univ. Coll.; Robert H. Parry, Middlesex; Hubert C. G. Pedler, Univ. Coll.; Mangalam Kesavavaliathan Gopala Pillai, London and Roy. Inst. Public Health; Ruth W. Plimsoll, Royal Free, St. Mary's, and Univ. Coll.; John Reid, Cork and Roy. Inst. Public Health; Percy M. Rivaz, Durham and Roy. Inst. Public Health; Campbell Ross, Glasgow; Effie F. A. Samter, Manchester and Univ. Coll.; Narinjan Singh Sethi, Punjab and Univ. Coll.; Robert W. G. Stewart, Belfast and Naval Med. School, Greenwich; Maurice L. Sutcliffe, Univ. Coll.; Ian S. Thomson, Aberdeen and Roy. Inst. Public Health; Joseph R. Tibbles, Aberdeen, Univ. Coll., and London; Joseph Whitby, Middlesex and Roy. Inst. Public Health; and Samuel A. Withers, Univ. Coll.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.

Yousif Abul-Nasr Barrada, Cairo; Phanindra Nath Basu, Calcutta; Madan Gopal Bhandari, Punjab; Hari Das, Univ. Coll.; William K. Dunscombe, Durham; Arthur A. Hearne, Aberdeen; Harrie B. Lee, Melbourne; George R. McRobert, Aberdeen; Percy S. Mills, Guy's; William L. Paterson, Glasgow; Percy S. Selwyn-Clarke, St. Bart.'s; Tinnevelly Subbiar Tirumurti, Madras; Hyla S. Watters, Cornell; Clifford L. Wilmoth, Chicago; and Arthur D. Wright, St. Mary's. (All the above were students at the London School of Tropical Medicine.)

DIPLOMA IN PSYCHOLOGICAL MEDICINE.

Douglas R. Alexander, St. Mary's and Bexley; Francis G. L. Barnes, St. Bart.'s and Colney Hatch; James D. Dyson, Middlesex and Maudsley; Alan F. Grimbly, Dublin and Colchester; Henry D. Hayes, Edinburgh and Bexley; William J. Lascelles, Belfast and Hanwell; Douglas B. M. Lothian, Edinburgh and Banstead; Ernest E. Pittman, Sydney and Bethlem; and Jyotirmay Roy, Calcutta and Bethlem.

DIPLOMA IN OPHTHALMIC MEDICINE AND SURGERY.

William E. Jennings, Edinburgh and Ind. Med. Service; Alexander E. MacDonald, Toronto and Roy. London Ophth. Hosp.; Reginald V. Martin, St. Mary's and Roy. London Ophth. Hosp.; Wazir Chand Mathur, Punjab and Roy. London Ophth. Hosp.; John K. Raymond, Edinburgh and Roy. London Ophth. Hosp.; Archibald A. B. Scott, St. Andrews and Roy. West. Ophth. Hosp.; Tarachand Dayasing Shahani, Bombay, Oxford, and Roy. London Ophth. Hosp.; Philip L. Stallard, St. Thomas's, Oxford, and Royal London Ophth. Hosp.; Lance H. Stanton-Cook, Sydney and Roy. London Ophth. Hosp.; Evan K. R. Thomas, Edinburgh and Birmingham and Mid. Eye Hosp.; Victor G. Walker, Trin. Coll., Dublin, and Roy. London Ophth. Hosp.; and Gladys M. R. Webster, Roy. Free and Cent. London Ophth. Hosp.

DIPLOMA IN LARYNGOLOGY AND OTOLOGY.

James B. Horgan, Cork and Golden Square; and William Wilson, Belfast and King's Coll. Hosp.

Sir Charles Sherrington was elected councillor for one year, vice Dr. Buzzard, now Censor. Drs. Drysdale, Poynton, Abram, and T. Wardrop Griffith were also elected councillors in place of Drs. Beddard, A. J. Hall, J. W. Russell, and Gowland Hopkins, who retire by rotation.—Sir Dyce Duckworth was reappointed representative of the Court of Governors of the University of Liverpool; Dr. Voelcker was reappointed on the Court of Governors of the University of Birmingham. Sir William Hale-White was reappointed representative on the Central Council for District Nursing in London. Sir Francis Champneys was appointed representative on the Central Midwives Board.—The President announced that the Council had appointed Dr. A. S. MacNalty to be Milroy Lecturer in 1925.—A proposed lecture on angina pectoris by Prof. Wenckebach, of Vienna, was approved.—A letter was read from Dr. J. A. Hayward, asking that the membership may be restored to him.—The Senior Censor gave notice that at a future meeting of the College he will move "That by-law 194 be amended so as to make women eligible for the Fellowship."—Reports were received from the Committee of Management as follows, and the recommendations made in them were adopted.

The Committee of Management recommend: (1) Addition of the East Suffolk and Ipswich Hospital to the list of hospitals recognised by the Examining Board in England: (2) addition of the Detroit College of Medicine and Surgery, Detroit, Michigan, U.S.A., to the list of institutions whose graduates in medicine are admissible to the Final Examination of the Examining Board in England under the conditions of Paragraph IV., Section III., of the Regulations.

The Committee had considered an application from a Diplomate in Public Health of the Royal Colleges for a certificate that he had obtained the diploma, his original diploma having been lost. There is no authority at present for issuing a certificate of a diploma granted jointly by the two Royal Colleges; in view of the number of such diplomas, the Committee think it desirable to make provision for issuing a certificate of a diploma; the Committee of Management therefore recommended that on receipt of a statutory declaration made by the applicant, setting forth the manner and date of the loss of the diploma, the secretary of the Conjoint Examining Board in England be authorised to issue a certificate stating that the diploma had been granted to the applicant and the date on which it was issued.

The Committee of Management had recently received applications for admission to the Final Examination from graduates of medicine of Russian universities, under the conditions of Paragraph IV., Section III., of the Regulations. In cases where the course of study and the examinations were completed before the year 1916 these applications were

granted. As the Committee are not satisfied that, under present conditions, the standard of medical education and examination on which the Russian universities were formerly recognised, is maintained, they recommended the Royal Colleges to remove the Russian universities from the list of institutions recognised by the Examining Board in England. The Committee recommended that the College of Medical Evangelists, Loma Linda, California, U.S.A., be added to the list of institutions whose graduates in medicine are admissible to the Final Examination of the Examining Board in England under the conditions of Paragraph III., Section III., of the Regulations.

After reports of some Committees had been received, and other formal College business transacted, the President dissolved the Comitia.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates have passed the Triple Qualification Examination :—

FINAL EXAMINATION.

Matthew Burn, Charles A. Murray, Leonard A. Watson, Richard F. Kerr, Alexander J. M. Findlater, Jitendranath Dey, Oswald L. Shearer, Donald Jack, Claude A. Parry, Wilhelmina Cochrane Storrie, Patel Shankerlal Hathibhai Masters, Akinlawon Adefolu, Hariprasanna Sen, David K. Fisher, Arnold Raff, Arthur W. H. Noble, Elizabeth Clark, Raymond L. A. Kitchen, Ivo E. Meier, Jacob S. Liptz, Isaac Goldberg, Joseph McAuley, William Melrose, and Clement A. Barrow.

Medicine.—William D. Howat, Annie H. Sutherland, John C. Colvin, Harry Myers, Matthew Clouts, Morris Kelman, Alexander S. Ballantine, Sam Noll, Sudhindra Nath Bandyapadhay, Israel Rostowsky, James Courtney, James H. MacAlpine, and Robert D. Scorgie.

Surgery.—Oliver H. D. Oliver, Frederick W. Robinson, Patrick Murray, James H. MacAlpine, and John Paterson.

Midwifery.—Joseph F. Sweeney, William D. Howat, John C. Colvin, Douglas D. O. McLoughlin, Harry Myers, Matthew Clouts, Morris Kelman, Sam Noll, and Robert D. Scorgie.

Medical Jurisprudence.—Robert H. McKinnon, John J. McKenna, Trevor Hughes, Petrus Johannes Badenhorst, David D. H. Craig, Eleanor P. Topping, Isaac Joels, Daniel T. Gemmell, John J. MacKenzie, Matthew L. Hendrie, Lewis Mackenzie, David S. Middleton, and Adam S. Gordon.

UNIVERSITY OF LONDON.—A meeting of the Senate was held on Jan. 30th, the Vice-Chancellor, Mr. H. J. Waring, being in the chair. The following appointments were made :—Sir Sydney Russell-Wells, M.P., member of the General Medical Council ; Dr. R. A. Lyster, representative at the thirty-fifth congress of the Royal Sanitary Institute to be held at Liverpool in July next ; Prof. H. R. Kenwood, representative (in respect of University College) at the above Congress.

A course of seven free public lectures on the current work of the Biometric and Eugenics Laboratories will be held at University College, Gower-street, W.C., on Wednesdays at 6 P.M., from Feb. 13th to March 26th inclusive. Among the subjects dealt with will be the "Biometric Study of Cancer," by Dr. M. Greenwood ; "Inheritance in Finger Prints and the Possibility of their Use in Cases of Disputed Paternity," by Miss Ethel M. Elderton ; and the "Contributions of Sir Francis Galton to Photography," by Prof. Karl Pearson.

TUBERCULOSIS SOCIETY.—An ordinary meeting of this Society will be held at the Margaret-street Hospital, Margaret-street, W., on Friday, Feb. 15th, at 8 P.M., when Dr. Clive Riviere will read a paper on Artificial Pneumothorax as I See it To-day. The annual provincial meeting of the Society will be held at Cambridge on Thursday, Friday, and Saturday, April 10th, 11th, and 12th.

HARVEIAN SOCIETY OF LONDON.—At the annual meeting of this Society, held on Jan. 16th at 11, Chandos-street, the following were elected officers of the Society for the year 1924 :—President : Dr. Reginald Dudfield. Vice-Presidents : Mr. D. C. L. Fitzwilliams, Dr. Montague Smith, Dr. W. E. Falconar, and Dr. C. M. Wilson. Treasurer : Dr. G. de Bec Turtle. Hon. Secretaries : Dr. Alfred Hope-Gosse and Dr. W. G. Bendle. Council : Dr. Edwin Ash, Mr. Gordon Bryan, Dr. Charles Buttar, Sir Crisp English, Mr. G. A. Ewart, Dr. W. Jagger, Dr. A. Langwill, Mr. C. A. Pannett, Dr. K. Playfair, Dr. E. F. Pratt, Dr. Herbert Tanner, and Dr. O. S. Thompson.

CONFERENCE ON MARITIME QUARANTINE.—Dr. Belisario Porras, President of the Republic of Panama, has called a conference to meet in Panama from Feb. 25th–29th to consider the international standardisation of maritime quarantine on the west coast of South America and the prevention of international spread of communicable disease along that littoral. The Secretary-General of the conference is Surgeon William Colby Rucker, U.S. P.H.S., Chief Quarantine Officer of the Canal.

The Right Hon. John Wheatley, M.P., Minister of Health, has appointed Dr. L. Haden Guest, M.P., to be his Parliamentary Private Secretary (unpaid).

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—At a meeting to be held at the Miller General Hospital, Greenwich, to-night (Friday), at 8.45 P.M., Dr. E. G. Annis in the chair, a paper on Experimental Work on the Internal Secretion of the Testis, and Rejuvenation Operations will be read by Mr. Kenneth M. Walker.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.—The next quarterly meeting of the Association will take place on Thursday, Feb. 21st, at 11, Chandos-street, Cavendish-square, W.1, under the presidency of Lieut.-Col. E. Goodall, M.D., at 2.45 P.M., when a paper entitled Twenty-eight Years' Lunacy Experience in Egypt will be read by Dr. John Warnock.

ASSOCIATION FOR THE PREVENTION AND RELIEF OF HEART DISEASE, NEW YORK.—At the annual meeting held in January the following Board of Governors was elected for a term of five years :—Dr. Nathan E. Brill, Dr. Lewis A. Conner, Dr. B. S. Oppenheimer, Mr. Vernon Munroe, and Mrs. A. F. Tiffany. The Governors proceeded to elect the following officers for the coming year :—Dr. Haven Emerson, President ; Dr. Robert H. Halsey, Vice-President ; Dr. William St. Lawrence, Secretary ; and Mr. Edwin O. Holter, Treasurer.

THE BRITISH ASSOCIATION : ANNUAL MEETING IN TORONTO.—The preliminary programme of the annual meeting of the British Association in 1924, to be held in Toronto, Ontario, on August 6th to 13th, under the presidency of Sir David Bruce, has just been issued. The Association will meet in 13 sections. In the section of anthropology, Mr. E. N. Fallaize, Vinchelez, Chase Court-gardens, Enfield, Middlesex, is recorder ; for physiology, Prof. C. Lovatt Evans, Physiological Laboratory, St. Bartholomew's Medical College, London, E.C. 1 ; and for psychology, Dr. Ll. Wynn Jones, 7, St. Mary's-avenue, Harrogate. The inaugural general meeting will be held on Wednesday, August 6th, in the Convocation Hall of the University.

THE LATE DR. A. H. COOK.—Dr. Augustus Henry Cook, who died at his residence at Hampstead on Feb. 1st, was the son of William Henry Cook, M.D., of Edinburgh. He was born in 1857, and was educated at Highgate Grammar School. After studying medicine at University College, London, he qualified L.S.A. and M.R.C.S. Eng. in 1881, obtained the L.R.C.P. Lond. the following year, and gained the M.B. Lond. in 1885. He became senior surgeon and senior anæsthetist to the Hampstead General Hospital, with which his association dated almost from its foundation. He held appointments as anæsthetist to the Hampstead Military Hospital, and as surgeon to the Rosslyn Lodge Auxiliary Military Hospital. He was medical officer to the Infants' Hospital, Hampstead, and clinical assistant in the Soho-square Women's Hospital. Dr. Cook was the author of four volumes of poetry—"The Sirens," "Rizpah," "Psyche," and "Eve Repentant." His contributions to medical literature included articles on typhus complicated with ulcerative endocarditis and cerebro-spinal fever due to pneumococcus.

MANCHESTER ROYAL INFIRMARY.—The report for 1923 states that the annual subscriptions show a substantial increase since 1922, and though through trade depression £584 of subscriptions had been withheld, there was to be set against this temporary loss a net permanent gain of £1618 in view of increased subscriptions. Donations were not up to the 1922 level, but patients' contributions were better than in previous year. The ordinary income of the infirmary and the Barnes Convalescent Home was £85,539, and the total ordinary expenditure was £108,894. The sum of £500 was spent on insulin, "from which markedly beneficial results had been obtained."

MOORFIELDS X RAY DEPARTMENT.—An appeal is being made by the Moorfields Eye Hospital for the sum of £700 to equip the X ray department with modern apparatus. At present the only apparatus in the X ray department which is in good condition is that invented by the late Sir James Mackenzie Davidson for localising foreign bodies in the eye. The committee consider the occasion is specially appropriate for commemorating the valuable services rendered to the hospital by Sir James Mackenzie Davidson, and in appealing for special donations for the X ray department they feel confident that the friends of the hospital will make a generous response. Contributions may be addressed to Secretary Superintendent, Moorfields Eye Hospital, City-road, E.C. 1.

THE LATE DR. T. B. SCOTT.—Dr. Thomas Bodley Scott, Mayor of Bournemouth, died on Feb. 2nd, aged 72. The son of a Brighton surgeon and a descendant of the founder of the Bodleian at Oxford, he received his early education at Brighton College, whence he proceeded to St. Bartholomew's Hospital to study medicine. Having graduated M.R.C.S. Eng. in 1874 and L.R.C.P. Edin. in the following year, he held an appointment for a time as house physician at St. Bartholomew's. About 1876 he took up general practice in Bournemouth, and soon won a position of esteem among his fellow townsmen. In 1921 he entered the borough council, and he died during his term of office as mayor. Dr. Scott latterly published several books of general as well as professional interest, such as "The Religion of a Doctor," "Why Do We Die?" "The Road to a Healthy Old Age," "Modern Medicine and Some Modern Remedies," and "Endocrine Therapeutics." He wrote with charm and with personal conviction, giving a message of hope for those past middle age who were beginning to feel the burden of the years. He was one of the first advocates in this country of the use of thyroid extract in threatening eclampsia, and of the value of anterior pituitary in high tension. In all his writings he brought to bear a wide and personal experience, so that the reader could feel he was on sure ground. Of his contributions to medical journals, an article on Vaccine Treatment appeared in THE LANCET, vol. ii., 1912.

With the death of Dr. Scott another living link with Robert Louis Stevenson has been snapped, for Dr. Scott was Stevenson's medical attendant and intimate friend between 1884 and 1887 when Stevenson was living in Bournemouth. When "Underwoods" was published it was dedicated to several of Stevenson's doctors, but especially to Dr. Scott. Of him Stevenson wrote: "But one name I have kept on purpose to the last because it is a household word with me, and because, if I had not received favours from so many hands and in so many quarters of the world, it should have stood alone—that of my friend, Thomas Bodley Scott, of Bournemouth." He married Adeline, daughter of Albert Savory, Potters Park, Chertsey, and had eight sons and two daughters.

VISITING ASSOCIATION OF THROAT AND EAR SURGEONS OF GREAT BRITAIN.—This Association has been formed in order to enable members of the specialty from different parts of the country to visit home and foreign clinics. It is intended to pay a short visit to a home clinic once a year, and another somewhat longer one to a foreign clinic. As the chief purpose is to study operative technique, the membership must necessarily be limited to a number who can watch an operation at one time in reasonable comfort. The first meeting of the Association was held in Edinburgh on Jan. 25th and 26th, when the morning of the first day was spent in watching the work in the throat clinic. Dr. J. S. Fraser performed two radical mastoid operations with skin grafting. Mr. J. D. Lithgow demonstrated the induction of fibrosis in the inferior turbinals by injection of carbolic in glycerine. Dr. W. T. Gardiner performed Sluder's ethmoidal operation, and Dr. G. Ewart Martin performed endoscopy, including aspiration and lavage of a bronchiectatic cavity. The afternoon was occupied in listening to the pathological demonstrations of Drs. A. Logan Turner and F. E. Reynolds (with lantern) on the intracranial complications of accessory sinus suppuration, and to Dr. Fraser on some points in the pathology of the inner ear. On the morning of the second day the members were able to watch Sir Harold Stiles, F.R.S., perform an operation of interest alike to the general and to the throat surgeon. He first operated upon a pharyngeal pouch, which by its smallness rendered the operation more difficult; he then removed from the neck a very large mass of tuberculous cervical glands in which abscess formation had occurred. After this a clinical demonstration was given by Dr. Douglas Guthrie, at the Royal Hospital for Sick Children. Sir William Milligan is president of the Association, the joint hon. secretaries being Mr. T. B. Layton, 10, Welbeck-street, London, W. 1, and Mr. Musgrave Woodman, 22, Newhall-street, Birmingham.

DONATIONS AND BEQUESTS.—The Royal Manchester Children's Hospital during the past month received subscriptions and donations amounting to £6521, including donations from His Majesty the King, part profits on the sale of Their Majesties' "Empire Day Message," the Lord Mayor of Manchester's Two Million Shilling Fund, £5000; Booth Charities, £250; Dickenson Charity, £150.—Hon. Louisa Henrietta Rennell, of Eaton-place, S.W., left £500 each to the Hospital for Consumption, Brompton, and the Hospital for Incurables, Putney; £1000 each to the Hospital for Seamen, Greenwich, and the British Hospital for Mothers and Babies, Woolwich; and £100 to the Earlswood Asylum for Idiots.—Mr. Alfred Charles Latter, of Sevenoaks, Kent, left £500 to the Eltham and Mottingham Cottage Hospital.—Miss Dora Twyford, of Whitmore Hall, Staffordshire, left £12,000 to the North Staffordshire Infirmary for the erection of a permanent annexe in memory of her father and mother, and £1000 for the general funds of the infirmary. She also left £12,000 to the Hanley Infants Welfare Society.—Mr. John B. Don, of Maulesden, has given £500 to the Forfar Infirmary towards the cost of a new surgical table and X ray apparatus.—By the will of the late Mr. Lewis Midgley, of Harrogate and Manchester, the testator left among other bequests £652 10s. to the Bradford Infirmary; £100 to the Bradford and District Nursing Association; £200 to the Harrogate Infirmary; and £500 to the Manchester Royal Infirmary.—The late Mr. David Politi, of Stoke Newington, N., left by will £500 to the Metropolitan Hospital for endowing a bed in the names of his late wife and himself; £100 to the Children's Hospital, Hackney; £100 to the Jewish Home for Incurables at Tottenham; and £100 to the Jewish Hospital, London.

MEMORIAL TO SIR FRANCIS FARMER.—The death of Sir Francis Farmer, the well-known dental surgeon, on Dec. 24th, 1922, was followed by letters in the press, in which a hope was expressed that a memorial to him and his work would be dedicated at the London Hospital. In November last a few friends decided to circularise by letter a number of those who were known to have been acquainted with Sir Francis Farmer. The letter stated that the proposed memorial was to be partly in the form of a mural tablet in the Dental School of the London Hospital, and partly in the form of an endowment of a scholarship or prize to be associated with his name. There was a wide response to the letter, but there are, no doubt, others, with whom the committee have been unable to communicate, who would like to be associated with the memorial. The committee wish it to be known that the fund is still open, and that subscriptions may be sent to either of the hon. treasurers, Mrs. M. L. Hodges, The Woodlands, Isleworth, or to Sir Herbert Ellissen, 24, Ulster-place, Regent's Park, N.W. 1.

POST-GRADUATE STUDY IN BONN.—A post-graduate course in X ray therapy and X ray diagnosis will take place at Bonn, Rhineland, Germany, from Feb. 24th to March 1st. The lectures will be under the following headings: (1) X ray burns and how to prevent them, by Prof. P. Krause; (2) X ray therapy in gynæcology, by Prof. O. von Franque and Prof. H. Martius; (3) X ray therapy in skin diseases, by Prof. E. Hoffmann and Dr. Schreus; (4) The physics of X rays, by Prof. L. Grebe; (5) The effect of X rays on plants, by Prof. M. Koernicke; (6) The changes produced by therapeutic irradiations from the point of view of the anatomical pathologist, by Prof. Prym; (7) X ray diagnosis in surgery, by Dr. Naegeli; (8) X ray therapy and diagnosis of internal diseases, by Dr. Kading. Medical men who wish to take part in this course of lectures should apply to Prof. Martius, Universitäts-Frauenklinik, Theaterstrasse 5. A registration fee of 5 gold marks is charged to cover the running expenses.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Feb. 11th.

WAR: at 5 P.M.
Paper:
Surg.-Comdr. R. J. G. Parnell, R.N.: Bismuth in the Treatment of Syphilis.
To be followed by a discussion.

Tuesday, Feb. 12th.

THERAPEUTICS AND PHARMACOLOGY: at 4.30 P.M.
Papers:
Mr. J. B. S. Haldane: Experimental and Therapeutic Alterations of Human Tissue Akalinity.
Dr. E. P. Poulton: Anuria in Hypoglycæmic Coma.
PSYCHIATRY: at 8.30 P.M.
Paper:
Dr. Crichton Miller: The Physical Basis of Emotional Disorder.

Wednesday, Feb. 13th.

SURGERY: SUB-SECTION OF PROCTOLOGY: at 5.30 P.M.
Cases and Specimens will be shown by Sir Charles Gordon-Watson, Mr. Gabriel, Mr. Graeme Anderson, and others.

Thursday, Feb. 14th.

NEUROLOGY: at 8.30 P.M.
Paper:
Dr. C. P. Symonds: Spontaneous Subarachnoid Hæmorrhage.

Friday, Feb. 15th.

ELECTRO-THERAPEUTICS: at 8.30 P.M.
Paper:
Dr. E. W. Twining and Dr. R. Williamson: Gas Replacement in the Treatment of Pleural Effusions.

ROYAL INSTITUTION OF GREAT BRITAIN, 21, Albemarle-street, W. 1.
TUESDAY, Feb. 12th.—5.15 P.M., Joseph Barcroft, F.R.S.: The Respiratory Pigments in Animal Life and Their Significance (Lecture I.).

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Feb. 11th.—8.30 P.M., Discussion on the General Symptoms and Remote Manifestations of Common Affections of the Naso-pharynx, Accessory Sinuses, and Throat. To be introduced by Mr. Herbert Tilley, followed by Lord Dawson, Dr. John Poynton, Mr. W. M. Mollison, Dr. E. M. Callender, Sir Thomas Horder, Mr. C. W. M. Hope, Mr. E. D. D. Davis, and others.

CUNTERIAN SOCIETY.
TUESDAY, Feb. 12th.—Annual Dinner at the Langham Hotel.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Feb. 11th.—5 P.M., Prof. W. Sampson Handley: General Peritonitis.
WEDNESDAY.—5 P.M., Prof. R. Lawford Knaggs: Osteogenesis Imperfecta.
FRIDAY.—5 P.M., Mr. V. E. Negus: The Mechanism of the Larynx.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W. 1.
MONDAY, Feb. 11th, to SATURDAY, Feb. 16th.—Combined Course on Diseases of Children. Clinical Demonstrations and Lectures from 10 A.M. to 4.30 P.M. daily, including the ROYAL WATERLOO HOSPITAL, VICTORIA HOSPITAL FOR CHILDREN, and PADDINGTON GREEN CHILDREN'S HOSPITAL.—CENTRAL LONDON OPHTHALMIC HOSPITAL. Clinical Lecture Demonstration every afternoon. Mon., 2 P.M., Mr. Oliver. Tues., 2.30 P.M., Mr. Gibb. Wed., 2.30 P.M., Mr. Levy. Thurs., 2.30 P.M., Mr. Cunningham. Fri., 4.30 P.M., Mr. Williamson-Noble (Pathological).—LONDON LOCK HOSPITALS. Clinical Work daily; Lectures at Dean-street. Mon., 5 P.M., Mr. Gibbs: Treatment of Syphilis. Tues., 2.30 P.M., Mr. McDonagh: The Theory and Practice of the Treatment of Syphilis. Wed., 5 P.M., Mr. Juler: Syphilitic Affections of the Fundus Oculi. Thurs., 2.30 P.M., Mr. Corbett: Practical Demonstration of Tests used in Syphilis and Gonorrhœa. Fri., 4 P.M., Mr. Johnston Abraham: Late Sequelæ of Gonorrhœa in the Female.—LONDON SCHOOL OF TROPICAL MEDICINE. Tues. and Thurs., 2 P.M., Special Clinical Demonstrations. NORTH-EAST LONDON POST-GRADUATE COLLEGE (Prince of Wales's General Hospital), Tottenham. Special Intensive Course (Second Week).

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Feb. 11th.—10 A.M., Surgical Registrar: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2.30 P.M., Mr. Addison: Surgical Wards.
TUESDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations and Wards. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 11 A.M., Mr. Simson: Gynæcological Dept. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10.30 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy Dept. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEBRUARY–MARCH, 1924.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, Feb. 11th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Epileptic Equivalents and Borderland Syndromes: Dr. Kinnier Wilson.
TUESDAY, Feb. 12th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Cranial Nerve Palsies: Dr. Risien Russell.
THURSDAY, Feb. 14th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Polyneuritis: Dr. Gordon Holmes.
FRIDAY, Feb. 15th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Recent Studies on the Vestibular Nerve: Mr. Sydney Scott.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, Feb. 11th.—12 noon, Neurosyphilis. II.: Dr. J. G. Greenfield.
The Fee for the Course, including Pathology, is £5 5s. For those who hold Perpetual Tickets the fee is £3 3s.

COURSE OF LECTURES ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.
WEDNESDAY, Feb. 13th.—12 noon, Development; Units of Structure and Function.
THURSDAY, Feb. 14th.—12 noon, Spinal Cord; Anatomy; Intrinsic and Extrinsic Systems: Dr. Kinnier Wilson.
The Fee for this Course will be £2 2s.
Dr. F. M. R. Walshe will give a COURSE OF EIGHT CLINICAL DEMONSTRATIONS, CHIEFLY ON METHODS OF EXAMINATION OF THE NERVOUS SYSTEM, in the Wards at 10 A.M., every Wednesday and Thursday during February. The numbers attending the Course will be limited. Fee £2 2s.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, Feb. 13th.—3.30 P.M., Papilloedema and Optic Neuritis: Mr. Leslie Paton.
The Fee for this Course alone is £5 5s. If taken in conjunction with the general Post-Graduate Course the fee is £3 3s. All applications should be sent to the Secretary, Medical School.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday morning at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the Office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Feb. 12th.—5 P.M., Dr. Graham Little: Pityriasis Rosea.
THURSDAY.—5 P.M., Dr. J. L. Bunch: Tuberculosis.

UNIVERSITY COLLEGE, Gower-street, W.C.
FRIDAY, Feb. 15th.—5 P.M., Prof. J. Robertson: The Influence of Improved Town Planning and Housing in Public Health. (Last lecture.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 14th.—4 P.M., Mr. Doyne: Ophthalmia Neonatorum.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, Feb. 13th.—4.30 P.M., Dr. T. B. Vaile: Surgical Anæsthesia by Nitrous Oxide and Oxygen.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Feb. 14th.—5 P.M., Mr. L. C. Rivett: The Value of Ante-natal Examination.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Feb. 11th.—(At the Children's Hospital.) Dr. Fordyce: Clinical and Pathological.
TUESDAY.—(At the Southern Hospital.) Dr. de Courcy: The Use of the Ophthalmoscope in General Practice.
WEDNESDAY.—(At the Northern Hospital.) Dr. M. Bligh: Empyema in Adults and Children.
THURSDAY.—(At the Stanley Hospital.) Miss Nicholson: Gonorrhœa in the Female.
FRIDAY.—(At the Royal Infirmary.) Dr. Buchanan: Medical Cases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
MONDAY, Feb. 11th.—4.15 P.M., Mr. S. R. Wilson: Recent Improvements in Anæsthesia.
TUESDAY.—4.15 P.M., Sir William Milligan: Present Position of Labyrinthine Surgery.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES.
THURSDAY, Feb. 14th.—4.30 P.M., Mr. A. C. Magian: The Gynæcological Causes of Married Unhappiness.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES.
TUESDAY, Feb. 12th.—(At the Royal Infirmary.) 3.30 P.M., Mr. Mouat: Common Disabilities of the Foot.
FRIDAY.—(At the Royal Hospital.) 3.30 P.M., Mr. Morrell: Radiology in the Diagnosis of Obscure Conditions. (Illustrated.)

SALFORD ROYAL HOSPITAL LECTURES.
THURSDAY, Feb. 14th.—4.30 P.M., Dr. H. T. Ashby: Rheumatism in Children.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Feb. 13th.—4 P.M., Dr. P. C. Varrier-Jones: Settlements for Tuberculosis.

Appointments.

FORRESTER, A. T. W., M.D. Lond., has been appointed Medical Superintendent of the Warwick County and County Borough of Coventry Mental Hospital.
GOMPERTZ, R. H. C., M.B., B.S. Lond., Medical Referee under the Workmen's Compensation Act for the County Courts of Barnstaple, &c.

MILLER, J. R., M.B., Ch.B. St. And., Resident Medical Officer, Dumfries Royal Infirmary.

O'SULLIVAN, P. T., M.D., B.Ch.R.U.I., Professor of Medicine, University College, Cork.

TODD, A. H., M.S., B.Sc. Lond., F.R.C.S. Eng., Consultant in Orthopædic Surgery for the Royal Air Force, and Assistant Surgeon, The Royal Hospital, Richmond.

Manchester Royal Infirmary: KLETZ, N., M.B., Ch.B. Manch., M.R.C.P. Lond., Senior Medical Registrar; BROCKBANK, W., M.R.C.S., L.R.C.P.; BROADHURST, W., M.B., Ch.B.; and FAIRBROTHER, R. W., M.B., Ch.B., House Physicians. LAMBERT, V. F., M.B., Ch.B.; MORRIS, L., M.B., Ch.B.; BACON, W. B., M.B., Ch.B.; FILDES, W. E., M.B., Ch.B.; BROMLEY, J. F., M.B., Ch.B.; and EDWARDS, N. L., M.B., Ch.B., House Surgeons. GALLOWAY, R. L., M.B., Ch.B., second Surgical Registrar. RYRIE, B. J., M.B., Ch.B. (Senior), and HAWORTH, A., M.B., Ch.B. (Junior), Pathological Registrars. POSTON, Mrs. MARGARETTE McL., M.B., B.Ch., B.A.O., Anæsthetist (Central Branch). PATERSON, R. S., M.B., Ch.B., Senior Assistant Medical Officer to the Radiological Department.

Vacancies.

For further information refer to the advertisement columns.

Birmingham General Hospital— Director of V.D. Dept. £600.
Birmingham, Queen's Hospital.—Med. Reg. £100.
Birmingham Union, Dudley-road Hospital.—Res. P. £650.
Bristol Royal Infirmary.—H.P.'s, H.S.'s, Obst. H.S., Cas. and Ophth. H.S. Each £80. Also Dental H.S. £116.
Camberwell Infirmary.—Asst. Med. Supt. £500.
Carlisle, Cumberland Infirmary.—Res. M.O. £175.
Edinburgh Royal Mental Hospital.—Asst. P. £350.
Evelina Hospital for Children, Southwark, S.E.—P. to Out-patients.
Glamorgan County Mental Hospital, Bridgend.—Jun. A.M.O. £350.
Hampton, Middlesex, Infant Welfare Centre.—Female Medical Practitioner. £1 11*s.* 6*d.* per session.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Res. M.O. £150.
Kent County Ophthalmic Hospital, Maidstone.—H.S. £300.
Malay States.—M.O.'s. and Health O.'s. £616.
Manchester, St. Mary's Hospitals.—Res. Obstet. S. Res. S.O. Each £200. Also two H.S.'s. Each £50.
Manchester, Victoria Memorial Jewish Hospital.—Two additional Anæsthetists. 50 guineas, with 10*s.* 6*d.* per attendance.
Nottingham General Hospital.—Res. Cas. O. £250.
Royal Chest Hospital, City-road, E.C.—P. to Out-patients.
Royal Earlswood Institution, Redhill, Surrey.—Jun. Asst. M.O. £250.
Royal National Orthopædic Hospital, 234, Great Portland-street, W.—Three Hon. Anæsthetists.
St. Bartholomew's Hospital.—Refraction Asst. One guinea per session.
St. Luke's Hospital, Chelsea, S.W.—Third Asst. M.O. £325.
St. Marylebone Hospital, Ladbroke-grove, W.—Third A.M.O. £300.
Sudan Government, Medical Dept.—Medical Inspector. £E.720.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg., Hon. Surg. Reg., and Hon. Obstet. Reg.
Windsor, King Edward VII. Hospital.—Hon. Asst. P.
Worcester General Infirmary.—Res. M.O. £200.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Markfield, Leicestershire.

Births, Marriages, and Deaths.

BIRTHS.

DICKSON.—At a nursing home, London, on 30th Jan., to Ethel (née E. S. Grey), wife of Flight-Lieutenant E. D. Dalziel Dickson, M.B., Ch.B., F.R.C.S., R.A.F., Lime Tree House, Wendover, Bucks—a son.

DUNCAN.—On Jan. 29th, at Purulia, India, the wife of Major A. W. Duncan, I.M.S., of a daughter.

RAYNER.—On Feb. 3rd, at a nursing home, wife of Francis L. Rayner, 65, Hornsey-lane, N. 6, of a daughter.

SUTHERLAND.—On Jan. 30th, at a nursing home, the wife of Halliday G. Sutherland, M.D., Canynge-road, Clifton, of a son.

MARRIAGES.

KNOBEL—RINTOUL.—On Feb. 4th, in London, William Bernard Knobel, M.D., M.R.C.P., to Ellen, eldest daughter of Mr. and Mrs. George Rintoul, of Angers, France.

DEATHS.

DE MORGAN.—On Jan. 27th, at St. Leonards, Campbell William De Morgan, M.B., of Montagu House, Upper Norwood.

HARDCASTLE.—On Feb. 2nd, at Sydenham-terrace, Newcastle-on-Tyne, William Hardcastle, M.B. Lond., L.R.C.P., aged 51 years.

WHITE.—On Jan. 30th, at Cannes, Lieut.-Colonel Joshua Chaytor White, C.M.G., I.M.S. (retd.), aged 59.

WILKIN.—On Jan. 27th, at Rose Ash, North Devon, John Frederic Wilkin, M.D., aged 84.

*N.B.—A fee of 7*s.* 6*d.* is charged for the insertion of Notices of Births, Marriages, and Deaths.*

Notes, Comments, and Abstracts.

THE "LITTLE THINGS" IN DIAGNOSIS AND TREATMENT.[1]

BY ARCHIBALD YOUNG, M.B., C.M., B.Sc., F.R.F.P.S. GLASG.,

PROFESSOR OF SURGERY, ANDERSON COLLEGE OF MEDICINE, GLASGOW; DEAN OF THE COLLEGE; VISITING SURGEON, WESTERN INFIRMARY, GLASGOW, ETC.

I HAVE often been impressed by the importance of comparatively insignificant details in the construction of a clinical picture. I have often tried to impress on my students, and on my house surgeons, the importance of attention to detail, both in the examination of a case, and in the construction of a diagnosis, on the basis of the facts of a clinical history, and the ascertained facts of a carefully made examination. I have often found, for myself, both the value of trifles apt to be overlooked, in the making of a reliable and correct diagnosis, and—not seldom, I regret to say—the value that they *would* have had, if they had been given due weight, in the prevention of error in the making of a diagnosis. Only too often, I am sorry to say, have I myself been able to look back, after the event, on a case, wrongly, or at least incompletely diagnosed, and been able to see how, if only due attention had been given to some symptom or sign, and its importance properly appreciated, a very different diagnosis, possibly a very different prognosis, would have been given, and, perhaps, a very different—even more favourable—issue would have resulted.

The Pathognomonic Sign.

You have heard, I dare say, the term "pathognomonic" applied to a certain symptom, sign, or group of symptoms and signs in a given disease, and perhaps you may have been—as I was in my student days—somewhat unduly impressed by such a term. One of my old teachers used it a great deal. He spoke of a reversal of the pulse-respiration ratio as "pathognomonic" of pneumonia, of the serpiginous outline of a syphilitic ulcer as "pathognomonic," of the barrel-shaped chest as "pathognomonic" of emphysema, and so on. In many cases his diagnosis of such conditions was perfectly correct, and the signs referred to led to a just appreciation of the lesion present, but it soon became evident to me that a scientific diagnosis demanded much more than that.

The Syndrome.

Nowadays you must have heard many speak of such and such a "syndrome," meaning, by the term, a combination of symptoms and signs, which, taken together, are regarded as characteristic of some particular disease—some symptom-complex, which being present, and actually demonstrated, or demonstrable, points unerringly to the correct diagnosis. While it may be worth while to recognise such combinations, as indicating—even with considerable emphasis—the direction in which the correct diagnosis should be sought, there is some danger of our falling into much the same error that the use of the term "pathognomonic" was apt to lead to.

It may be conceded that certain symptoms and signs, or certain combinations of these, generally or even always occur in particular diseased conditions, but they are not always equally developed or evident; in come cases they may be obscured by other symptoms and signs. It is at least true to say that a too slavish adherence to the "pathognomonic," or to the "syndrome" idea is liable to lead to error, and it is equally true to say that it does not tend to the cultivation of the really scientific habit in construction of a clinical diagnosis.

Important Signs.

There are, however, many examples of symptoms or signs which furnish useful indications of the nature of the disease from which a patient is suffering. Take, for instance, the diagnostic significance of pain, local or referred, in all manner of conditions. Several years ago, when I had under my professional care a young girl on whom I operated for a very acute mastoiditis, the girl's father mentioned to me, quite casually, how his wife was much troubled by "rheumatic" pains in her shoulder, and that she was often simultaneously afflicted by so-called bilious attacks. I was not then being consulted professionally on the matter; I did, however, remark, even then, "What about gall-stones?" The husband reminded me of my remarks a year

[1] An abstract of a lecture delivered to the Queen Margaret Medical Club, Glasgow, on Nov. 19th, 1923.

later, when I was sent for to see his wife professionally. She had suffered much, meantime, and had been under the care of several physicians, having been labelled as suffering from panniculitis, rheumatism, neuritis, &c. She had had several courses of systematic massage, and no end of anti-rheumatic remedies. I saw her, found her slightly jaundiced, gave a diagnosis of gall-stones which proved correct, removed her gall-bladder and the gall-stones, and all her symptoms disappeared.

Or, take another example. Suppose you are confronted with a doubtful abdominal case, in which you are told that the bowels act with normal frequency. It is seldom advisable to accept, without personal verification, the assurance either of patient or of friends. A simple answer in the affirmative to the question, "Are the bowels all right?" should rarely be taken as sufficient. You must learn exactly how often the bowels act daily, weekly, &c., and of any growing difficulty or frequency, any accompanying pain, tenesmus, mucus or blood in the stools; you must see the stool for yourself. You will get many surprises, and, I am very certain, much valuable information. I have found an astonishing failure on the part of doctors, nurses, house surgeons, patients even, to prosecute properly this line of examination. In my wards I have no difficulty now—but at first I found it more difficult—to carry out a proper examination of the stools. My regular march to the bath-room to inspect the results of enemata has long ceased to furnish a theme for amusement, for we have had numerous examples of the valuable information to be obtained there.

One might multiply such examples almost indefinitely, but let these examples suffice for the purpose. I do not wish to dwell on these instances as suggesting the possibility of building a diagnosis on single, or even on a few, symptoms or signs—that would be, once again, our old "pathognomonic" sign—but I wish to emphasise the desirability of taking into consideration all the striking signs in constructing a clinical picture.

Signs in Eye Conditions.

I am indebted to Dr. Maitland Ramsay for the following note regarding particularly suggestive symptoms and signs in the diagnosis of different eye conditions:—

"Unconsidered trifles frequently missed by the unobservant, are often of great value, both in diagnosis and prognosis. Every branch of medicine furnishes examples, and these instances from ophthalmology may be of interest.

"A patient may complain, in an indefinite manner, of his sight, and of a feeling of discomfort in his eyes, but, at the time of examination no abnormal signs can be detected. Nevertheless, if that patient, in the course of conversation, says that, during the previous year, he has had to change his spectacles several times, and, in reply to an inquiry, admits that he has noticed, on many occasions, a rainbow-like halo round a lamplight, a diagnosis of glaucoma can be made without much hesitation.

"Or another patient, with the same general complaint of difficulty in seeing, so as to recognise a friend in the street, or to read a printed page, may state that, to him, blue has now become a predominant colour; that, for example, when he looks at a bunch of sweet peas, they all appear to be in different shades of blue, or, when in a theatre, the chorus girls all appear to be dressed in blue. In such a patient, careful testing will reveal, in all probability, a central scotoma for red and green, and a diagnosis of toxic amblyopia may be established quite readily, even although the ophthalmoscopic findings are negative. Such a patient, when his colour defect is pointed out, may then describe, if he be at all observant, how he has been struck, of late, when walking along the street, by the almost corpse-like pallor of the passers-by; or, if he is a golfer, he may admit the difficulty he has been having lately in distinguishing the red flags on the greens, while he can see the white flags with comparative ease; if he is a billiard player, he may confess that, in certain positions, he cannot see the red ball.

"Another patient may complain that, although he sees to read, he has difficulty in passing from one line to another, and is constantly losing his place. His friends, perhaps, have noticed that he only eats the food on one side of his plate, and that, if anyone approaches him from behind, say, from his left-hand side, he does not see the person. Almost certainly, that patient is suffering from hemianopia."

Dr. Maitland Ramsay also drew my attention to a note which appeared in THE LANCET of Oct. 20th, 1923, regarding an investigation being conducted in Leicester into the causes of "felting" of underwear. The writer of the note was reminded of "the late Sir William Osler's tale of the ailing child of wealthy parents; it was before the days of vitamins and a numerous flock of consultants stood baffled around the puling infant. At last an aged practitioner took the child's napkin, extracted it with water, and applied the guaiacum test. The test was positive and scurvy stood revealed." This story furnishes a good example of an "unconsidered trifle," appreciation of which might be productive of a good result.

Diagnosis and Prognosis.

The term diagnosis literally connotes "knowing through" or "through and through." Actually, we conceive it as involving the due consideration of every kind of evidence, the placing of each factor in its proper relation to all others, a correct appraisement of anatomical relations, the facts of known physiology and of pathology, and their importance in relation to a particular lesion. Ætiology, also, has come to have a greatly added importance in the making of any diagnosis. In the beginning of things medical, diagnosis was not given so restricted an application as we are apt to give it to-day; nor was there the same tendency to separate it from what we now speak of as prognosis. Or, rather, it might be more correct to say that prognosis, a more ancient term than diagnosis, had a much wider and more comprehensive scope. I have heard the late Sir William T. Gairdner emphasise the fact that Hippocrates meant by "prognosis" not merely "fore-knowledge," but also a process of talking of, or interpreting, the disease beforehand—prior, that is, to the patient's recounting of his symptoms. Thus the use of the word by Hippocrates was not exactly like our present-day application of it. The close association of prognosis with diagnosis has not only the warrant of antiquity, but the very obvious justification of logical connexion. The prognosis in any case of disease hinges largely on the accuracy and completeness of the diagnosis, and it is the prognosis that the patient, or his friends, chiefly want.

In the course of a recent conversation with Sir James Mackenzie, the latter took my breath away at one point, by suddenly saying, "What does diagnosis matter? It is of very little importance. What really matters is prognosis. Is the man going to die? When is he going to die? How is he going to die? Why is he going to die? How does cancer kill a man? Why do our cancer patients die? What is it that kills them? It's not the cancer. What is it?" And so on. There is obviously very much we have still to learn. There are very many problems still to be solved. And, probably most of these solutions, when achieved—if they ever are—will be reached, not as the result of any astounding discovery, but as the result of appreciating in their proper meaning, and in appraising at their proper value, sundry details—little things, unconsidered or imperfectly considered, whose importance has been missed.

Treatment.

There remains for consideration the aspect of the subject concerned with treatment. The good physician or surgeon, as a rule, pays most attention to the little details: treatment must be based upon a constant watchfulness of the patient's progress. A sudden, perhaps trifling, change for better or for worse, should not go unnoticed; its immediate, or, at least, its early recognition may count for a very great deal in the prospects of the sufferer. Observation is wanted just as much in treatment as in the making of a diagnosis, and changes occurring during treatment may greatly influence prognosis.

Suppose you are watching the progress of a case, and, for days, perhaps, things have been going badly. The patient not only seems to be getting steadily worse, but he may even seem to have given up the fight himself. The Vis medicatrix naturæ no longer shows any sign of effort after recovery. You go in to see him one morning, and you appreciate a change for the better at once. He has had a shave—a thing he had no idea of for, it may be, days before. In other ways as well he has begun to recover his self-respect—shall we say?—and he shows it. He is going to make a fight for it yet—you know it almost instinctively. Or, to take another example, suppose you have a critical abdominal case, and, spite of all treatment, medical or surgical, improvement tarries. You find, some day, that the tongue, previously dry and brown and cracked, has begun to clean, and has become moist, and, probably you very soon find other evidences of improvement, such as disappearance of tympanites, cessation of vomiting, relief of nausea, return of desire for food, lessening of thirst. Your outlook for the patient is at once affected for the better.

A complete reversal of either of the pictures I have just described would, on the other hand, require to be given corresponding weight.

One aspect of the problem of little things is that which deals not so much with the cure of the patient, in the usual acceptation of the term, as with the *care* of the patient. To a weak and helpless patient, whose bodily powers are already much below par, the most trifling ills or discomforts

are apt to be magnified greatly, and their individual as well as their combined and cumulative effect may go far to turn the scale towards a less favourable result than might otherwise be looked for. A crumb, a crease in the sheet, a slight unevenness in the mattress, a noise, uncontrolled light, a buzzing and persistent fly, disordered bedclothes, too hot or too cold a water-bottle, a harsh word from an attendant, a slip-shod serving of a meal, may have great influence for evil upon the prognosis. On the other hand, one can hardly over-estimate the good effect that may be exerted by the reverse conditions. Here comes in the value of efficient nursing; the efficient nurse is faithful in small things as in great.

And the efficient doctor is the one who, with a good scientific equipment, can combine fidelity in observation and unremitting attention to the daily care of his patient, with the gift of sympathetic realisation of his patient's aches and pains. I have known great surgeons, and celebrated physicians, who were utterly incapable of "caring for" their patients, being devoid of sympathy, ignorant of the many simple devices or remedies which can accomplish so much in the way of imparting added comfort, and intolerant of peevishness or fretfulness.

I can never be too thankful for the good fortune which brought me, at a certain stage of my professional career, into contact with a man, endowed with many gifts, whose greatest achievement was in the after-care of his patients. From him I learned how to deal with such disturbing factors as flatulence, thirst, digestive defects contingent on many surgical conditions, the after-care of abdominal operations, preparations for an operation of any kind, special details in the preliminary preparations for rectal operations, and so on. I learned how much the average patient came to lean on his own doctor; how he appreciated consistent personal care; how he resents, in many cases, his being relegated to the care, soon after operation, of an assistant or nurse, however skilled and attentive. I have come to realise, since, how much the patient counts it for good that the surgeon himself shall dress his wound.

In what I have just said I have been concerned to emphasise the fact that the actual treatment of the patient is something far transcending the removal or eradication of the disease from which he is suffering. The art of medicine is a big thing indeed; viewed solely from the therapeutic point of view, it is big enough. None the less true is it however, to say that the "little things" count for very much, if not, in fact, to remove dis-ease, at least to make dis-ease more bearable, or less unbearable. The sympathetic touch, the gentle word, the watchful eye, are more than mere figments of imagination, mere interesting details used by the sentimentalist in writing of the rôle a good nurse and a good physician or surgeon may aspire to fill. The larger issues, the great principles, the immutable laws remain; what I have here presented is but a fragment, a side issue, an aspect of study, a little bundle of comments from experience.

SMOKE ABATEMENT.

A BOOK on Smoke Abatement[1] appears opportunely at a time when, as Dr. Cyril Banks, medical officer of health of Halifax, points out in a foreword, there appears to be a revival of public interest in the problem of a pure air-supply. The author aims at giving sanitary inspectors and public health officials a proper understanding of the sequence of events in a furnace, and of the fundamental principles involved in the use of the various instruments and appliances designed to secure complete combustion and to prevent unnecessary smoke. This object has been attained in a satisfactory manner, and the numerous illustrations contribute valuable assistance thereto. All interested in the subject will agree with Mr. Clinch that it is a pity that stoking has hitherto been regarded as an unskilled trade. Untrained inspectors are the logical sequel. One of the hopeful suggestions in the book is that, if the inspector knows his work, the stokers are only too willing to learn from him. If we are to do any good in this matter of industrial smoke prevention we must have skilful stokers and well-trained smoke inspectors. Let us hope that the enthusiasm aroused by the clean air of our industrial towns during the coal strike will not be damped down by the specious plea that the smoke from the domestic chimney, owing to the lower temperature at which it is given off, is more injurious than the smoke from the factory chimney. We want to reduce both varieties to a minimum. Mr. Clinch seems to think that an Englishman's love of an open fire is incurable, and pins his faith to low-temperature coke as a remedy for domestic smoke. We fancy, however, that the need for labour-saving in these days has converted a good many lifelong fire-pokers to the use of gas. Mr. Clinch's book ought to help to keep alive interest in this important problem, and will be of value, not only to public health workers, but also to mill-owners and managers and all who have an interest in the proper management of factory chimneys.

[1] The Smoke Inspector's Handbook or Economic Smoke Abatement. By Herbert G. Clinch, Chief Smoke Inspector, Halifax. London: H. K. Lewis and Co., Ltd. 1923. With 59 illustrations. Pp. 136. 7s. 6d.

WOOLLEN UNDERWEAR AND BODY BELTS.

A NUMBER of garments, together with samples of materials used by Messrs. Lyle and Scott, Ltd., of Hawick, in the manufacture of underwear, including body belts for adults and children, have been submitted to us for examination. The specimens comprised bleached and "natural" fabrics of varying qualities. They were soft, well woven, and a microscopic examination showed that the fibres of all the specimens responded to the tests for pure wool. It is a matter of importance in the case of articles for use next to the skin that when claiming to be wool they should consist of this material and nothing else.

PHYSICAL ENERGY.

IN an entertaining little book Bombardier Billy Wells (London: T. Werner Laurie, Ltd. 1923. Pp. 153. 3s. 6d.) sets out to show how physical and mental energy may be developed by the practice of boxing. By itself, the book would not be particularly interesting, but coupled with the name of its distinguished author, it at once attracts attention. Physical energy is largely the gift of the gods; books may teach us how to conserve it, but it must exist before it can be trained, and essays on physical energy may be as useful (or useless) to the listless as advertisements of hair culture are to the bald. But though it is doubtful if readers of this book will gain much physical energy from a study of the author's views, they will find much of interest in his many personal touches. The intention of this book is to show how boxing may become a rational method of physical culture. The boxer is contrasted with the purely muscular weight-lifter, the latter being likened to an elephant, the former to a Derby winner. In this connexion two interesting sculptures are reproduced. The first is that of "Physical Energy," by G. F. Watts, showing a mounted equestrian; the second is that of "The Farnese Hercules," whose massive muscles would do credit to a Shire horse. It is stated in the preface that this book has been written in collaboration with an eminent medical authority, and a reference to the last chapter on spinal nerve pressure raises the suspicion that the "eminent medical authority" is greatly intrigued by the modern teachings of osteopathy. The reader is informed that "if one of the vertebræ should become even slightly displaced, the channel is narrowed and the nerve within it is pressed upon, causing a great variety of symptoms accompanied by disturbance of one or more of the bodily organs." Pathology of this stamp is not impressive, but the Bombardier's reminiscences of his steps up the ladder of fame are worth reading.

HEALTH CONDITIONS IN BECHUANALAND.

Mr. J. Ellenberger, Government Secretary, in his report on the affairs of the Protectorate for the year 1922, states that the returns of diseases among the European and native populations show a low degree of incidence and severity all round. The prevalent diseases have been malaria, with its complications and sequelæ, syphilis, and influenza. With regard to malaria, there was during the year a remarkable absence of outbreaks affecting entire communities or areas. The total returns represent a collection of infrequent and mild individual cases scattered over a wide extent of territory. There has been a marked increase in the return of venereal diseases. This is, however, more an indication of extended observation, as connected with the special work of the dispensaries provided for the purpose, than of absolute increase. The influenza outbreaks were mild and of the ordinary catarrhal type, most of the cases recovering after a week or ten days. Epidemics of measles, unattended by any special features of severity or mortality, occurred at Serowe and elsewhere. The total number of cases, both indoor and outdoor, treated during the year was 1700, with, so far as ascertainable, a mortality of 1·06 per cent. The total rainfall for the year ended March 31st, 1923, was 23·192 inches. The Protectorate is bounded on the south and east by the Union of South Africa, on the north-east by Southern Rhodesia, on the north by the Zambezi and Clobe Rivers, and on the west by the territory of South-West Africa. It has not been surveyed as a whole, but its area is estimated at 275,000 square miles. It lies roughly at between 2000 and 5000 feet above sea level, and only a few people live at the cooler altitudes of from 4000 to 5000 feet. The portion of the country inhabited by the greater number of both Europeans and natives is adjacent to the only line of railway, which passes through the eastern side of the Protectorate for a distance of 403 miles.

Hunterian Lecture
ON
TESTICULAR GRAFTS.

Delivered before the Royal College of Surgeons of England on Feb. 4th, 1924,

BY KENNETH M. WALKER, F.R.C.S. ENG.,
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IT is the custom as a prelude to the delivery of one of these lectures to trace some link between the subject chosen for discussion and the work of the illustrious man whose name the lecture serves to commemorate. On the present occasion this connexion is particularly intimate, for it is recorded that in 1780 John Hunter succeeded in the task of transplanting the testicle of a dog. Although the full import of this experiment does not appear to have been realised at the time, the fact that transplantation had been achieved may well have acted as an inspiration to Berthold and other pioneers of grafting in the work that they carried out nearly a century later. It will be seen, therefore, that the subject of testicular grafts that I have chosen for my present lecture is singularly appropriate. Before, however, proceeding to my main theme it will be convenient to say a few words on the subject of treatment by means of testicular extracts.

TESTICULAR EXTRACTS.

Brown-Séquard was the first to call attention to the use of extracts of animals' testicles as a therapeutic agent. His experiments were conducted on his own person and consisted of injecting subcutaneously a freshly prepared extract of the testicle of the dog. He claimed that as the result of these injections a definite improvement in his health was brought about, accompanied by a great increase in muscular and mental energy. Indeed, so marked was the effect that he was enabled, after having abandoned his researches on account of failing health, to return to his laboratory, and to remain there hard at work up to the time of his death at an advanced age.

Since the time of Brown-Séquard testicular extracts have been extensively employed in clinical medicine, although observations on the subject of a scientific or exact nature are remarkably few. Zoth and Pregl have proved that subcutaneous injections of orchitic extract do not of themselves produce an increased capacity for muscular effort, but that when the injections are combined with muscular exercises ergograph records show an increase of as much as 50 per cent. in efficiency. However, that the injections are not entirely free from danger has been demonstrated by Loisel, who found that the ovaries and testicles of fishes, frogs, birds, and mammals all contained toxic substances which, when injected subcutaneously, may provoke serious symptoms or even death. On account of this, Brown-Séquard's methods of subcutaneous injections have to a great extent been abandoned in favour of oral administration.

A great number of commercial preparations of orchitic extracts are at present on the market. My own observations have, in the main, been made with a special extract prepared at the Lister Institute from fresh bull's testicles. This extract has been used on a large scale at St. Mary Abbots Hospital, Kensington, and through the courtesy of Drs. V. Korenchevsky and J. A. Lumsden Cook, I have been allowed to examine some of the patients under treatment. Accurate records have been kept throughout the course of treatment, and certain simple psychological tests of memory, attention, and fatigue carried out by an observer trained in these methods. As the result of what I have seen, and of my own previous experience, I have come to the conclusion that extracts of testicle, when administered by the mouth, are entirely without effect. It is true that in a certain number of cases an improvement in general health or in mental energy has been claimed after taking the extract, but in none of these cases have I been able to convince myself that this was not the result of mental suggestion. I am strongly of the opinion that the active principle of testicular extract, whatever it may be, is destroyed by the digestive juices, and that the only hope of obtaining results is by the use of subcutaneous injections. Pariser, it is true, has made observations of a substance prepared from testicular tissue, and administered by the mouth, which he claims is not so destroyed, but his claims have not yet been substantiated.

Of preparations available for subcutaneous or intravenous injections, such as testogan, prepared from a formula of Dr. Iwan Bloch, I have as yet but little personal experience, but I am convinced that it is in the discovery of an effective preparation of this nature that the chief hope of the future progress of the organotherapy of the testis lies. However brilliant the results that the implantation of a testicular graft may sometimes give, it is obvious that severe limitations are imposed on such a method of treatment, and that as was the case in the organotherapy of the thyroid, but little advance will be made until the use of grafts is replaced by that of a really efficient extract.

TESTICULAR GRAFTS.

The partial success that followed the use of thyroid grafts towards the end of the last century revived interest in the subject of gland transplantation in general, and it was not long before further attempts were made to remedy testicular deficiency by the use of grafts. The difficulty of obtaining material has resulted in an extensive trial of animal grafts, and although it has long been obvious that these are rapidly absorbed, good results have sometimes been obtained owing to the fact that during the process of absorption a certain quantity of internal secretion finds its way into the blood stream. L. L. Stanley, who has worked particularly along these lines with animal grafts, has reported very favourably on their use. His method of implantation, although seemingly crude, would appear to have had the merit of enabling the treatment to be carried out on a large scale, his own observations being made on 656 prisoners in the Californian State prison. All that Stanley found necessary was to cut up the testicle into very small fragments and to inject these through a syringe with a large calibre needle into the subcutaneous tissue of the abdominal wall. Strange to say, very little local trouble would appear to have followed this crude method of implantation, the grafts being palpable as small subcutaneous nodules until they became completely absorbed a few months later.

In order to avoid the fate that invariably overtakes grafts obtained from the lower animals, Voronoff in 1920 made use of a testis taken from an anthropoid ape. As the result of this and of many subsequent operations he has come to the conclusion that grafts obtained from the higher apes are capable of surviving in the human body for an indefinite period. In his "Greffes Testiculaires," published in 1923, he has reported cases in which the improvement following a graft has persisted for as long as three years, and he himself is not inclined to set any limit to the duration of the benefit that may result from their use. Other workers, notably Lydston, Lichtenstern, Lepinasse, and Morris, have used for the purpose of grafts human testicles obtained from recently executed criminals, from patients dying as the result of accident or of certain specified diseases, and from cases of ectopia testis. In my own work I have made use of the last-named source, and am convinced that it is the most practical method of procuring suitable material for this purpose. Whatever may have been Voronoff's results with grafts derived from the higher apes, it is obvious that the chances of success are greater if human tissue be used. An ectopic testis,

deficient though it may be as regards spermatogenesis, is usually well-developed from the point of view of internal secretion. In those cases in which there is a healthy and normally placed testicle on the opposite side, and in which the shortness of the cord is an obstacle to orchidopexy, removal of the misplaced organ is justified, for, as Lipschutz has shown, as little as 1 per cent. of the total testicular tissue is sufficient to maintain masculinisation. Most of the material used in my own series of cases recorded below was obtained from young donors between the ages of 10 and 22, in whom the secondary sex characters were well developed. Previous to operation a Wassermann test was performed, and a careful examination carried out in order to exclude the existence of tuberculosis, malaria, or any other constitutional disease. The operative technique, the type of case selected for grafting, and the results obtained will now be considered.

OPERATIVE TECHNIQUE.

Many different sites have been selected for the implantation of grafts, the most commonly favoured being within the peritoneal cavity or in a subperitoneal pocket, in such a muscle as the rectus abdominalis, within the cavity of a long bone, in the spleen, in the subcutaneous tissue and, in the case of testicular grafts, within the tunica vaginalis of the scrotum. It has been shown that the healing in of a transplanted gland is invariably preceded by a transient phase of degeneration which, slight at the periphery, becomes more intense towards the centre. Until vascularisation can take place the graft is dependent for its nutrition on osmosis from the surrounding tissues. Once the blood-vessels have found their way from the periphery towards the centre of the graft a process of regeneration starts, the surviving cells of the graft proliferating and the central necrosed area becoming transformed into connective tissue. It will be seen, therefore, that the critical period in the history of a graft is the period prior to vascularisation during which the transplanted organ is dependent for its nourishment on osmosis. Now the implantation of a graft within the peritoneum or in a serous sac like that of the tunica vaginalis has a definite advantage. It provokes a certain amount of serous exudation, which furnishes an excellent medium for the survival of the graft during these critical days. For this reason in my own work I have followed the technique of Lydston and Voronoff, and have placed my grafts within the tunica vaginalis. Only in those cases in which, owing to previous disease or operation, the vaginal cavity has become obliterated have I had recourse to Lichtenstern's method of embedding grafts in the rectus muscle, and even in those cases I have made a practice of placing an additional graft in a subperitoneal pocket. When the tunica vaginalis has been the site of previous inflammation, as in most cases of genital tuberculosis, or when difficulty is found in identifying the vaginal cavity on account of partial obliteration, it is useless to persist in any attempt to place a graft in the scrotum. In those cases in which I have infringed this rule (see Case 6) the grafts have either failed to vascularise or else have been rapidly absorbed.

The actual technique of the operation is as follows. The donor having been anæsthetised, the misplaced testicle is removed with as little trauma as possible, and if practicable surrounded by its serous sac. Until required it is wrapped in gauze wrung out in saline and placed in a sterilised bowl. Although the implantation of the graft can be carried out under local anæsthesia, I prefer the use of a general anæsthetic, as in my opinion it is best to avoid the risk of damage to the tissues through the infiltration of novocain. An incision is made in the upper half of the scrotum and the cavity of the tunica vaginalis opened. Bleeding-points are then tied, special attention being paid to hæmostasis throughout the whole operation since post-operative bleeding is likely to jeopardise the safety of the graft. The testicle to be grafted is then removed from the bowl in which it has been stored, the sac opened and the body dissected away from the epididymis. The testis is then divided into two halves by sagittal section and the halves subdivided into three. Each of these portions is then attached to the tunica vaginalis and anchored in position by fine catgut sutures in such a way that the glandular surface of the graft is in contact with the serous surface of the tunica vaginalis. In order to encourage vascularisation the tunica vaginalis may be lightly scarified as a preliminary to the implantation of the graft. In those cases in which a testicle exists in the recipient a graft may conveniently be placed in the digital fossa between the epididymis and testis (Fig. 1). Care must be exercised to ensure that no two grafts are in contact, as such contact is likely to cause necrosis. After making sure that the three grafts are well placed, I close the tunica vaginalis by means of a continuous catgut suture, and bring together the scrotum in two layers, one line of sutures uniting the deep fascia and the other the skin. The same proceeding is then carried out on the opposite side. It is unnecessary to point out that the strictest asepsis must be observed throughout the operation.

FIG. 1.

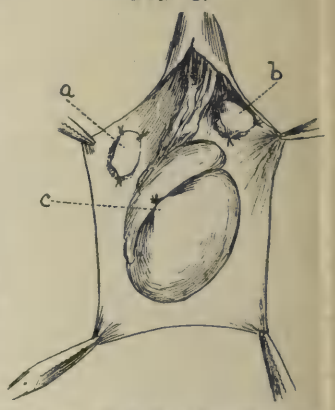


Diagram showing technique of testicular grafting. The tunica vaginalis has been laid open and three grafts (*a*, *b*, *c*) inserted. *a* and *b* are attached to the parietal layer of the tunica vaginalis, and (*c*) inserted in the digital fossa of the testis by means of fine catgut sutures.

Dressings are then applied and the patient is returned to bed. For 24–48 hours after the operation a certain amount of swelling of the scrotum is usually noticed, the swelling being due to the transudation of the serous fluid into the vaginal cavity; this transudation, as has previously been pointed out, plays an important part in maintaining the life of the graft during the critical period that precedes its vascularisation. At the end of a further three or four days this local reaction subsides. The patient may usually be allowed up, wearing a suspensory bandage for from 10 to 14 days from the date of the operation.

INFLUENCE OF TESTICULAR GRAFTS ON THE PATIENT'S METABOLISM.

It was felt that a few cases of testicular grafts carefully examined before and after treatment would furnish more reliable evidence of the value of the method than a larger number in which the examination had been less complete. In the cases recorded in literature by other workers the proof that the transplant has had effect rests entirely on clinical grounds, reliance being placed on the patient's general appearance, his capacity for greater muscular exertion, his mental condition, and his sexual history. These criteria, although of undoubted value in assessing the effect of a graft, are not absolutely reliable, for they are all likely to be influenced by the factor of mental suggestion. In order to obtain data on which more confidence could be reposed in several of the cases recorded below, a careful investigation was carried out of the metabolism of the patient before and after operation. Although little is at present known of the influence exercised by the gonads over metabolism, it is, at any rate, certain that such an influence exists. Heymans has shown in the cock that total castration diminishes metabolism by 20–25 per cent., and that partial castration diminishes the respiratory exchange by some 15 per cent. Löwy and Richter, working on castrated dogs of both sexes, found that after castration metabolism was reduced

in the proportion of 14–20 per cent. per kilo. of body-weight, and that this reduction was maintained for months or even years. They also concluded that the reduction of metabolism after castration is due to a diminution of the processes of oxidation, but that the obesity that not infrequently follows may be constitutional and is not necessarily degenerative. The work of Dixon, Mackenzie Wallis, and others on ovarian secretion suggested to me that alterations in the internal secretion of the testis might equally well be rendered evident by the employment of sugar-tolerance tests, and that valuable evidence of the "taking" of a testicular graft might, therefore, be obtained by carrying out careful blood-sugar estimations, before and after operation. This has been carried out for me by Dr. P. O. Ellison, assistant pathologist to the Royal Northern Hospital, whose results are appended to the case reports given below. To him my thanks are due for the care and interest he has shown in these investigations, as also to the Medical Research Committee for providing me with the necessary apparatus. Investigations of metabolism have been kindly carried out for me by Prof. Winifred Cullis, and her results are also appended.

Although the observations on the blood-sugar curves are too few to allow of any deductions concerning the influence of testicular secretion on sugar tolerance, they have served their purpose in demonstrating that, as a result of the graft, an alteration in tolerance has taken place.

CASE 1.—Patient, aged 29, wounded July, 1916, a fragment of shell lodging in the pubis just at the root of the penis, destroying the right testicle and causing an extensive hæmatoma of the abdominal wall. The remains of the right testicle were removed on reaching the hospital. Subsequently the left testicle atrophied as the result of interference with its blood-supply. At the time of wounding the patient's age was 23, and he was in every way normal as regards sexual development. He had married a year previously, had regular intercourse three or four times a week, and was athletic in his habits, representing his unit in boxing and running. Previous to the outbreak of war he had earned his living as a general labourer. Subsequent to the loss of the testes certain changes occurred. His weight dropped from 10 st. 4 lb. to 8 st. 13½ lb., and the growth of the beard diminished so that instead of shaving on alternate days as he had previously done he now shaved only every fourth day. There was complete loss of potency and absence of sexual desire. The bowels, which had previously acted regularly, now gave trouble, so that he was forced to take a purgative daily. Associated with these changes was a complete alteration in mentality; he lost interest in everything and the slightest effort produced fatigue, so that he could not even read the newspaper or a magazine. Half an hour's walk was sufficient to cause exhaustion, and after his discharge from the army he was compelled to give up his former work in favour of a less strenuous occupation. In addition to constipation and fatigue he complained of occasional "cold sweats" and of attacks of "giddiness" on bending down. The patient felt his condition so acutely that he readily consented to operation. Before grafting various laboratory examinations were made. Details of these are appended. In addition to these pathological investigations, and in order to obtain an unbiased estimate of the patient's psychology, he was sent to the National Institute of Industrial Psychology, and examined by Dr. G. H. Miles, whose report is given in extenso below.

Operation.—On Dec. 15th, 1922, under general anæsthesia, six grafts from the ectopic testis of a boy of 10 were inserted, three into each tunica vaginalis, according to the technique previously described. Convalescence was uneventful, the wounds healing by first intention and the stitches being removed on the eighth day. On the tenth day the patient noted the beginning of transient erections, which gradually became more frequent and stronger. He became conscious at the same time of an improvement in his general health. When seen five weeks later the erections were strong and well maintained and there was a definite return of sexual desire. The growth of the beard had increased so markedly that he was compelled to shave daily. From this time onwards he began to take more exercise and to show a renewed interest in life. Instead of sitting listlessly in a chair as was his previous habit, he bought newspapers, went three times to the theatre in one week, and became generally energetic. On Jan. 24th, 1923, he effected coitus with complete success. When seen on March 7th, nearly three months after his operation, he appeared to be in excellent health. His weight had increased from 8 st. 13 lb. to 9 st. 12 lb. and he reported that he was taking long walks, and had decided to abandon his sedentary occupation in favour of an open-air life. He had regular coitus with his wife and on two occasions he had in addition experienced a nocturnal emission. When examined, the grafts could still be felt in the scrotum, although they seemed definitely smaller than when previously examined.

A letter received on Jan. 21st, 1924, states that the patient remains in good health. Sexual desire is strong and he is able to gratify it. He reports that he is shaving daily, that the growth of hair is strong and is increasing in amount both on the chin and on the scalp. The results of the blood examination before and after operation, and Dr. Miles's psychological report are appended.

	Dec. 12th.	Jan. 22nd.
Hæmoglobin	90%	80%
Leucocytes	3,700	15,400 per c.mm.
R.B.C.	5,600,000	4,800,000 ,,
Colour index	0·8	0·8
Differential count:		
Polymorphs	51·5%	64%
Lymphocytes	45·5%	34%
Large mononuclears	2·0%	2·0%
Eosinophils	0·5%	0·0%
Basophils	0·5%	0·0%
No abnormal cells.		
Blood-urea	40 mg.	37 mg. per 100 c.cm.
Wassermann test	Negative.	

Psychological Report.

Tests.	1st exam. (Dec. 14th, 1922.) (Before operation.)	2nd exam. (Jan. 31st, 1923.) (After operation.)	Percentage improvement.
General Intelligence:—			
1. Opposites	21	34	+62
2. Analogies	9	10	+11
3. Mixed sentences	9	9	+ 0
4. Completion	23	39	+70
5. Reasoning	10·5	11·5	+ 9
Total	72·5*	103·5‡	+43
Fatigue: Kraepelin addition:			
(*a*) Total time sustained	130 secs.	895 secs.	+588
(*b*) Total number sums added	69	615	+791
(*c*) Average number sums added per minute	31·9	41·2	+ 29
(*d*) Av. rate per 10 secs. (first 40 secs.)	7·0	6·8	(− 3)
(last 40 ,,)	3·0	6·0	(+100)
Loss	4·0	0·8	+800
Average improvement			+552
Physical Test — Dynamometer:			
(*a*) Right hand (average of six trials)	19·5†	25·5§	+31
(*b*) Left hand (average of six trials)	22·8	24·9	+ 9
Average improvement			+20

Note.—Marked improvement is shown in every type of test. The improvement is most striking in the "fatigue" test; well-marked in the test of general intelligence (particularly in tests of speed and attention); and least in the test of physical strength.

* Distinctly below the average level for young adults—viz., 100.

† Equivalent to the strength of grip of an 11-year old boy.

‡ Slightly above the average level for young adults.

§ Nearly equivalent to the strength of grip of a 14-year old boy.

Report on Respiratory Exchange, by Prof. Winifred Cullis.

The striking features in this case are the marked increase in oxygen consumption per square metre of surface after the operation, and the improved capacity for work. In the first two observations (although certainly some improvement had occurred at the time of the second observation), the patient was unable at the quick rate of breathing induced to obtain an adequate exchange. The quick, shallow breathing gave an oxygen intake less than that needed in the sitting position, and as a consequence there followed anoxæmia and faintness. In the third observation the condition was clearly improved. There was a better intake of oxygen during the exercise, and the response to the increased carbon dioxide was much better under control, so that in the recovery period, although the respiration was

still quick, the rate was compensated for by an increased depth of respiration and an adequate oxygen intake. Even in this observation, however, there was a tendency to failure at the fifth minute, corresponding to a slightly diminished intake; that, however, passed off quite quickly.

In both Case 1 and 2, therefore, there is a definite improvement as shown by the respiratory exchanges. It is hoped to make another series of observations at a later date.

Oxygen Consumption.	Dec. 14th.	Jan. 23rd.		Jan. 29th.		
Resting and post absorptive.						
Lying—	Per c.cm.	c.cm.	Pulse.	c.cm.	Pulse.	Resp.
Per minute ..	260	300	68	410	72	36
Per metre per min.	153	180		244		
Sitting—						
Per half min. ..	295	223		256	..	R. = 44
Exercise 1½ mins.—						
1st half min. ..	295	343		548		
2nd " ..	408	456		648		
3rd " ..	453	—		620		
Recovery—						
1st " ..	346	—				
2nd " ..	—	426		368		
3rd " ..	—	313		327		
4th " ..	270	—		299		
5th " ..	233	—		—		
6th " ..	246	202		248		
7th " ..	192	—		—		
8th " ..	209	232		235		
9th " ..	—	—		—		
10th " ..	203	221		217		
11th " ..	—	—		—		
12th " ..	—	—		—		
13th " ..	*189	209		247		
14th " ..	—	—		—		
15th " ..	—	208		—		
16th " ..	—	—		209		
17th " ..	—	—		—		
18th " ..	—	266		—		
19th " ..	—	—		278		
20th " ..	—	174		—		
21st " ..	—	—		—		
22nd " ..	—	—		262		
23rd " ..	—	—		—		
24th " ..	—	*288		—		
25th " ..	—	256		286		
				297		
	After 20 mins. ..			280	..	R. = 52
	Pulse 67			280		

* Began to feel faint.

CASE 2.—A naval officer aged 34. This case was referred to me by Dr. Langdon Brown, under whose treatment he had previously been. The patient showed a very marked degree of eunuchoidism with a history of having suffered from mumps complicated by double orchitis at the age of 13. The effects of this were not at first noticeable and from 17–21 he had led a fairly active sexual life. At 23 he discovered that his testicles were small in size and that he was losing interest in sexual matters. (Fig. 2.) At the same time there was a steady increase in weight. At 31 he was operated on for an abscess in the antrum of Highmore and one month after the operation was seized with violent headaches, terminating in vomiting. These cerebral attacks continued for two years, although repeated X ray examinations failed to reveal any trouble in the sinuses. In December, 1922, he consulted Dr. Langdon Brown, who discovered the eunuchoid condition and believing that his headaches were pituitary in origin put him on a combination of pituitary and orchitic extract. Under this treatment his headaches diminished in intensity. In May, 1923, he was referred to me for grafting.

His condition at that time was as follows: Age 34, height 6 ft. 1 in.; weight 14 st. 8 lb. The most striking feature about the patient was the development of fat, especially in the gluteal, supra-gluteal, and mammary regions. There was nothing unusual to note about the bony or muscular development, which appeared normal for a man of his age, except that the muscle tone was generally poor and the abdomen unduly prominent and pendulous. The complexion was somewhat striking, the skin having a faintly yellow tint and the cheeks being a dusky crimson.

Hair.—There was a marked alteration in the distribution of hair. The hair of the head was plentiful and curly, but except in the axillæ and on the pubis it was absent from the trunk. The arms and legs were equally smooth. The pubic hair, although plentiful, ended above in a well-defined horizontal line as in the female. There was no hair about the umbilicus or around the nipples.

External Genitalia.—The penis and scrotum appeared normal, the testes were undersized, unduly soft to the touch, and without testicular sensation. Cremasteric reflex absent. Prostate small. Vesicles not felt. There was marked development of the breasts with rosy nipples and complete absence of hair. The mental condition excellent, although previously the patient had suffered from prolonged bouts of despondency. Blood counts, sugar-tolerance tests, and metabolism curves are appended later.

Operation. — August, 1923, under general anæsthesia, six grafts were inserted, three into each vaginal cavity.

Course of Case.—Normal. The patient was discharged on the fourteenth day feeling well but otherwise no change was noted.

Blood Count.—R.B.C., 5,200,000; W.B.C., 12,000; hæmoglobin, 86 per cent.; colour index, 0·82. Differential: polymorphs, 53 per cent.; lymphocytes, 41 per cent.; large mononuclears, 4·5 per cent.; eosinophils, 1 per cent.; basophils, 0·5 per cent. Wassermann test negative.

Subsequent History.—No change was noted until Sept. 17th, 1923, when an increased growth of hair on the chin was detected, the growth in 12 hours being as much as previously occurred in 24. There was also a change in the character of the nipples, which had lost their rosy pink and taken on a more masculine hue. Nocturnal emissions were more frequent and erections stronger. There has been a steady diminution in weight since the operation (15 st. to 13 st. 9 lb.) and an increase in energy. He has had no headaches. Nov. 19th: No marked change since previous examination. There is certainly an increase in the rate of growth of hair, so that the patient now shaves daily. The deposits of fat in the breasts, buttocks, abdomen, and thighs do not appear to have diminished. The patient feels remarkably well, and is capable of greater muscular effort. In view of the fact that other glands are involved in the deficiency he has been placed on pituitary extract.

FIG. 2.

Case of eunuchoidism showing typical changes associated with lack of internal secretion of the testis. The arrangement of the pubic hair is as in the female, and there is marked hypertrophy of the breasts, increase of fat over the hips, and disappearance of hair on the body. The patient was treated by means of testicular grafts placed in the tunica vaginalis.

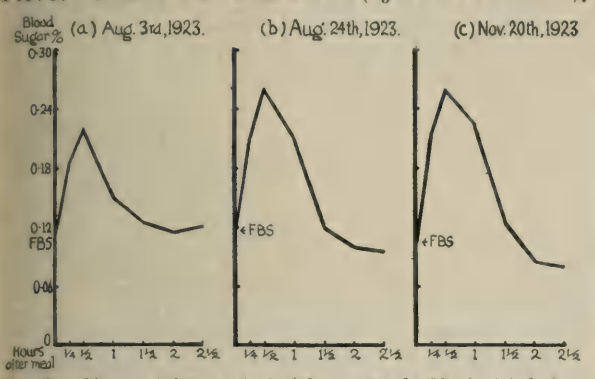
Report on the Respiratory Exchange, by Prof. Winifred Cullis.

Oxygen Consumption.	July 3rd.		Nov. 14th.
Lying—			
Per min.	297 c.cm.	....	288 c.cm.
Per sq. metre per min. ..	137·5 c.cm.	....	138 c.cm.
Cals. per sq. metre per hour	38	....	38
Exercise—			
1st half min.	658·4 c.cm.	....	436·5 c.cm.
2nd "	876·4 c.cm.	....	592·0 c.cm.
6th "	1225·0 c.cm.	....	814·0 c.cm.
8th "	—	....	774·7 c.cm.
Recovery—			
10th half min.	732·4 c.cm.	....	—
11th "	—	....	201·9 c.cm.
14th "	—	....	162·1 c.cm.

This case presents certain differences from Case 1. The departure from the normal is not so great, and the oxygen consumption (slightly below normal) is practically the same

for both observations. The respiratory quotient throughout is extraordinarily low, never rising above 0·79 and falling to 0·66 during the exercise. There is, however, in the second observation a marked improvement with regard to exercise; the oxygen consumption does not rise so greatly (the subject weighed 13 lb. less), and the return to the normal level is almost complete within three minutes of the cessation of exercise. At the first examination the oxygen consumption was still considerably above the resting value three minutes after work had ceased. (Fig. 3.)

FIG. 3.—*Glucose-Tolerance Curves (by Dr. P. O. Ellison).*



Case 2.—Glucose-tolerance tests (glucose meals, 50 g.): (*a*) before, (*b*) after testicle graft, (*c*) four months later. Urine: (*a*) no sugar before test, slight reduction after one hour, no reduction after two hours; (*b*) no sugar before, much sugar one hour after glucose, a trace after another hour; (*c*) no sugar before test, much sugar one hour after glucose, a trace after another hour. F.B.S. = fasting blood-sugar.

CASE 3.—The patient, aged 15¼, was an intelligent healthy-looking boy who complained that he had been rejected for the Air Force owing to his lack of development. On examination he resembled a boy of 12, his height being 4 ft. 11 in. and his weight 6 st. 12 lb. The external genitalia were very small, not larger than those of a boy of 7. The testicles were the size of almonds and very soft to the touch. There was complete absence of hair on the body and the limbs. There were no abnormal deposits of subcutaneous fat on the breasts or elsewhere about the body and nothing of note in the bony development. The condition appeared to be one of delayed puberty possibly resulting from a pituitary defect of the Loraine type. An examination of the mental development carried out by Dr. Miles showed that the patient was distinctly above the average of the ordinary secondary school scholar. In contrast to previous cases sent for examination, he showed an unusual resistance to mental fatigue. The patient's parents were of normal development, but he had a brother who was also juvenile in appearance. Orchitic extracts by the mouth having failed to produce any effect, grafts were employed.

Operation.—On August 27th, 1923, three grafts were inserted in the right tunica vaginalis and at the same time circumcision was carried out on account of phimosis. On examination of the small testicle exposed during operation it was found to be of the variety generally seen in undescended testicle, the epididymis being large relative to the testis and separated from it by a large digital fossa in which a graft was placed. The wound healed by first intention and the patient was discharged on the fourteenth day.

Subsequent History.—He was examined on Nov. 9th, two and a half months after operation; height 5 ft., weight 6 st. 11 lb. No change could be seen beyond the appearance of some very fine hairs upon the pubis. The grafts could still be felt in the upper part of the scrotum. On Dec. 12th, continued growth of fine hair on pubis; height 5 ft., weight 6 st. 13 lb. The patient is still under observation. Although there has only been an increase in height of one inch since the operation, and although the genitalia do not appear to have increased materially in size, the growth of pubic hair is of favourable import.

CASE 4.—Patient, aged 21, was admitted to the Miller Hospital under the care of Mr. Cecil Joll on Feb. 5th, 1923, for symptoms of pituitary tumour, the symptom being persistent headache, vomiting, and failure of vision. Although 21 years of age he had the appearance of a child of 12, and it was stated that he had not grown since that age. Vomiting had started at the age of 13, had no relation to food, and was accompanied by severe occipital headache. During the last six months there had been failure in eyesight, marked loss of flesh, and a great increase in the severity of his symptoms. Examination of the discs showed a condition of "choked disc" with surrounding œdema and small superficial hæmorrhages. Skiagrams negative. Examining the patient from the point of view of the genitalia I found that he had development of a boy of 10. The testes could just be palpated and appeared unusually soft. There was complete absence of hair on the trunk, and only a few fine hairs on the forearm and thigh. There was no prominence of the breasts, and the amount of subcutaneous fat was everywhere below the normal. Although unusually intelligent and alert, the patient appeared to have no sexual knowledge, and never to have shown any interest in the opposite sex.

A diagnosis of the pituitary tumour was made, and in view of the increasing symptoms a decompression operation was carried out on Feb. 8th by Mr. Joll. On the 12th I inserted three grafts into the right vaginal cavity, in order to test their effect on the patient's genital development.

Subsequent History.—Three days after the operation the patient called the house surgeon's attention to the fact that he was experiencing erections for the first time in his life. These continued and appeared to become stronger, but unfortunately the cerebral condition, which had at first been benefited by decompression, again began to cause trouble. A second decompression on the left side was therefore carried out, again with temporary benefit. The patient, however, showed progressive emaciation, and his condition steadily deteriorated until his death on July 20th.

Post Mortem.—The body showed a very severe degree of emaciation. Over the pubis, which previous to the operation had been bare, were some strong dark hairs. On removing the brain a tumour, about the size of a walnut, was found on the upper part of the medulla, spreading upwards into the fourth ventricle, and extending laterally between the pons, medulla, and cerebellum.

Examination of Genitalia.—The scrotum was opened and the testicles removed for examination. The only remains of the grafts that could be found consisted of a small area about a centimetre in diameter in the upper part of the tunica vaginalis. Mr. Geoffrey Keynes's report on his histological examination of this area is appended, as well as the report on the patient's testicle.

Sections of Testis and Testicular Graft.

(1) *Graft.*—The graft appears as a thin layer of tissue lying on the surface of the epididymis. No normal tubules remain in the graft; each appears to be represented by a space containing one or more large structureless cells with peripheral nuclei. No interstitial cells can be seen with Soudan III. Although the testicular tissue appears to have degenerated almost completely, the graft contains several well-formed blood-vessels. The epididymis and vas deferens are normal.

(2) *Testicle.*—The tubules of the testicle are undeveloped. There is no sign of spermatogenesis. No interstitial cells can be seen in paraffin or gelatin sections, though small fat globules are visible among the epithelial cells in a few of the tubules.

Note.—The only positive results obtained by grafting in this case were the onset of erections and the development of pubic hair. The very marked emaciation and the rapid downward course of the patient as the result of his cranial condition were, however, unfavourable factors.

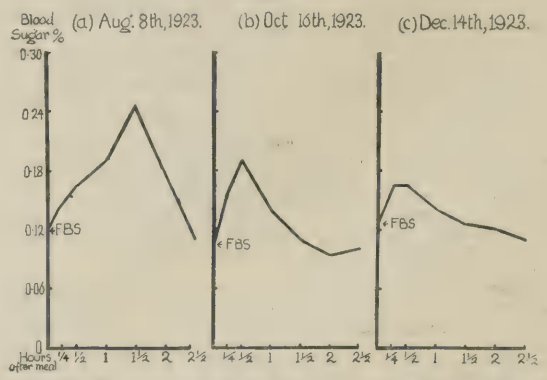
CASE 5.—Patient, aged 39; in August, 1922, had left testicle removed for tuberculosis; in April, 1923, had right testicle and cord removed for recurrence of disease on opposite side. Since the loss of his second testicle he had not been conscious of any marked change either physical or mental. Partial erections occasionally in the morning: no nocturnal emissions. The patient was engaged to be married and presented himself for grafting in the hope that this would allow him to carry through his plans. His only complaint was that erections were rare and transient, and that he was conscious of a very definite loss of muscular energy so that he tired after a comparatively short walk (one mile). Previous to his operations he had walked 12 miles without difficulty. He was not conscious of any mental deterioration, memory and concentration being good, nor had he suffered from depression or other alterations in temperament. Since his operation he had lost a stone in weight. On examination the chief indication of lack of testicular secretion was the absence of hair about the trunk and limbs, except over the pubis, and in the axillæ. However, he still shaved daily, and the hair of the scalp was unaltered. There were no abnormal deposits of subcutaneous fat or development of the breasts. The penis had not appreciably altered in size and the prostate was still palpable.

Operation.—On Sept. 9th, 1923, grafts from the ectopic testis of a man of 38 were employed and were inserted in the following situations: (1) Right tunica vaginalis, (2) left rectus, (3) subperitoneally in the left inguinal region. Convalescence was as usual, except that the patient complained a week later of intense frontal headaches. These were intense for a week and then gradually diminished. Associated with the headaches was a certain degree of

polyuria, as much as 66 oz. being passed per diem. A careful examination failed to discover any cause for the headaches in the eyes, nasal passages, or sinuses, and it is possible that they were pituitary in origin and resulting from the action of the grafts on that gland.

At the end of ten days the headache diminished in intensity, the polyuria ceased, and the patient stated that he felt better. He is still under observation, but has up to the present noted very little change in sexual feeling or in the strength of his erections. However, that the grafts have not been without influence is shown not only by the phenomenon of headaches and polyuria already referred to, but also by the change in the blood-sugar curves.

FIG. 4.



Case 5.—Glucose-tolerance tests (glucose meals, 50 g.): (*a*) before, (*b*) after testicle graft, (*c*) two months later. Urine: (*a*) no sugar before test; no further example could be obtained; (*b*) and (*c*) no sugar before or after taking glucose.

Blood Count (August 3rd, 1923).—R.B.C., 5,300,000 per c.mm.; W.B.C., 7200 per c.mm.; H.C., 94 per cent.; C.I., 0·89; polymorphs, 58 per cent. (4176 per c.mm.); lymphocytes, 32 per cent. (2304 per c.mm.); large mononuclears, 8 per cent. (576 per c.mm.); eosinophils, 2 per cent. (144 per c.mm.); basophils, 0 per cent.; no abnormal cells seen; Wassermann, negative.

General Examination of Urine (Dec. 14th, 1923).—Clear pale yellow urine with a small sediment. Reaction: Acid. Specific gravity: 1018. Albumin: 0·7 per cent. Sugar: Nil. Centrifugalised deposit: A few red blood cells. Fairly numerous white blood cells. Casts in moderate numbers, all hyaline. Some epithelial cells from the urinary tract. (Fig. 4.)

CASE 6.—Patient, aged 58, had had both testicles removed for tuberculosis, the right in November, 1921, the left in January, 1922. Subsequent to castration he put on over a stone in weight. There was also a diminution in the rate of growth of the beard, so that he only required to shave on alternate days, whereas previously he had shaved once or sometimes twice daily. Moreover, the bowels, which had previously been regular, now gave him great trouble, so that he was entirely dependent on purgatives. For two months after operation he had noted erections, but these were now absent. There was complete loss of sexual desire, but occasional nocturnal emissions, unaccompanied by any dream. In temperament he had changed so that he was inclined to be despondent and was without initiative. He complained of hot flushes occurring very frequently and causing him a good deal of distress. These started in the face which became very red, so that other people noticed it. The flush then spread to the rest of his body and he broke out in a profuse perspiration.

Operation.—On Feb. 12th, 1923, an incision was made over the upper part of the scrotum. Considerable difficulty was experienced in finding the vaginal sac, which appeared to have been in great part obliterated, as a result of the previous operation. A bed was made for three grafts on either side, in what appeared to be the remains of the vaginal cavity, and the scrotum was closed in the usual manner.

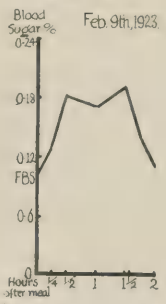
Course of Case.—For the first three weeks after operation the patient stated that he felt remarkably well, that his appetite had improved, and that he felt much less depressed. He engaged in reading and writing, and said that his hot flushes troubled him very little. A week after the operation he had had an erection. The improvement, however, that was at first noted was not maintained, and when seen two months later the patient had relapsed into his previous condition. On examining the scrotum no remains of the grafts could be felt, and it is almost certain that they had become completely absorbed. The failure in this case was due to the error of persisting in the scrotal operation instead of abandoning the attempt to find a tunica vaginalis and emplanting the grafts, as in Case 5, in the rectus muscle. (Fig. 5.)

	Feb. 8th, 1923.	Feb. 22nd, 1923.
Blood Count:		
R.B.C.	4,960,000	5,840,000
W.B.C.	10,800	12,000
Hæmoglobin	90 per cent.	90 per cent.
C.L.	0·9	0·79
Differential Count:		
Polymorphs	46 per cent.	66·5 per cent.
Eosinophils	3 ,, ,,	2·5 ,, ,,
Large mononuclears	4 ,, ,,	3 ,, ,,
Large lymphocytes	4 } 44 per	2·5 } 26·5 per
Small ,,	30 } cent.	24·0 } cent.
Transitionals	3 per cent.	0·5 per cent.
Blood urea	17 mg.	

CASE 7.—The patient, aged 30, was referred to me by Dr. Crichton Miller as a typical case of dementia præcox. He gave no evidence of testicular deficiency, but in view of the work of Mott and others on the degenerative changes occurring in the testes in these cases it was considered justifiable to try the effect of a graft.

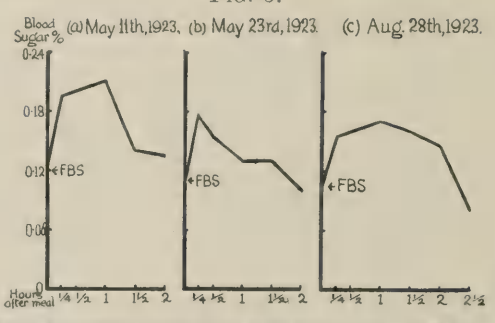
Operation.—Grafts were implanted on May 15th, 1923. The patient was seen two or three times after the operation, but no alteration in his condition, either mental or physical, could be found. Estimation, however, of the blood-sugar curves showed that the grafts had not been without effect on his metabolism. In view of the fact, however, that dementia præcox is associated not only with changes in the testis but also with widespread degenerative processes

FIG. 5.



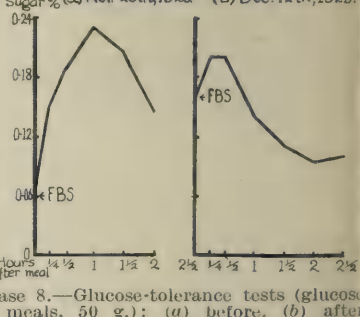
Case 6.—Glucose-tolerance tests (glucose meals, 50 g.). Unfortunately no curves were obtained after operation.

FIG. 6.



Case 7.—Glucose-tolerance tests (glucose meals, 50 g.): (*a*) before, (*b*) after testicle graft, (*c*) three months later.

FIG 7.



Case 8.—Glucose-tolerance tests (glucose meals, 50 g.): (*a*) before, (*b*) after testicle graft.* Urine: (*a*) no sugar before test; no further sample could be obtained; (*b*) no sugar before test; glycosuria present one and a half hours after the meal.

* This patient partook of a fairly substantial meal immediately before the time appointed for his test. It was only possible to keep him fasting for two hours from the beginning of his lunch, as the alternative meant the complete abandonment of the tolerance test. Hence his "fasting" blood-sugar shows a state of hyperglycæmia. It is worthy of note that otherwise the type of response to 50 g. of glucose before and after the testicle graft is identical with that of Case 5.

in the endocrine as well as in the central nervous system, it would be too much to expect that a testicular graft should have any tangible effect in such a condition.

Blood count (May 11th, 1923): R.B.C., 5,200,000; leucocytes, 6800; hæmoglobin, 100 per cent.; colour index, 0·96. Differential count: Polymorphs, 59 per cent.; lymphocytes, 32 per cent.; large mononuclears, 6 per cent.; eosinophils, 3 per cent.; basophils, 2 per cent. (Fig. 6.)

CASE 8.—Patient, aged 45, referred to me by Colone L. W. Harrison for impotence. The patient stated that he had occasional erections in the morning, but that they were transient in character. Sex desire was present though feeble. There were no obvious signs of testicular deficiency. He shaved daily, showed well-marked hair development, and normal development of the genitalia. He had been treated for syphilis and the right testis was indurated and shrunken.

Operation.—On Nov. 20th, 1923, six grafts were implanted within the scrotum. On Dec. 7th the patient stated that he had several strong and more prolonged erections. As he had to leave for Canada, no further opportunity occurred for examining him. (Fig. 7.)

CASES 9 and 10.—In both of these cases grafts were implanted for senility during the course of an operation for prostatectomy. Case 9 made an excellent recovery and left the hospital in a greatly improved state of health. As, however, most of this could be accounted for by the beneficial results of prostatectomy, it is impossible to say to what extent the testicular grafts had any effect. Case 10 was a feeble old man with marked kyphosis, bronchitis, and cardiac trouble, who died three weeks after enucleation, of pulmonary complications. During the first part of his convalescence he had made good progress, and on his death his relations (who knew nothing of the insertion of the graft) deplored to the house surgeon the misfortune of his death as he had been so well after his operation, and, what was so remarkable, the hair on his head had begun to grow again!

At the autopsy I examined the grafts that had been inserted. The operation had not been an aseptic one and there was evidence of suppuration. A microscopic examination of the grafts showed necrosis, more marked towards the centre of the graft. It is probable that the temporary improvement in his condition and the growth of hair were due to absorption of hormone, even although necrosis had occurred.

INFLUENCE OF THE GRAFTS ON THE GLUCOSE-TOLERANCE CURVES.

For the following description of the method of examining the patients, and for his comments on the changes observed in the glucose-tolerance curves after operation, I am indebted to Dr. P. O. Ellison.

"The method of blood-sugar estimation devised by Prof. H. MacLean has been used throughout. After a fast of three hours, a sample of blood was taken from the patient, who was immediately given a dose of 50 g. of glucose in 150 c.cm. of water. Further samples of blood were taken at intervals up to a period of two or two and a half hours. The amount of sugar in each sample was estimated, and a curve plotted from the results.

"The first curve in each series was made a few days before the operation; the second curve between two and three weeks after operation, to gauge the immediate effect of the absorption of testicular substance, allowing an interval for any possible inflammatory change to subside; the third after a further interval of from two to three months.

"In each case a definite change in the response to 50 g. of glucose has been found in the curve taken shortly after the graft. It might be expected that any modification that occurred would be of the same nature. The response of one patient, however, differs in a very striking manner from all the others (Case 2).

"In three of the patients, in the test taken before operation, the blood-sugar does not reach its maximum until one and a half, one, and one hour respectively. The maximums were unusually high—0·23, 0·25, and 0·21. The blood-sugar had diminished to approximately normal values within two to two and a half hours. These curves, therefore, show that the patients had a definite diminution of sugar-tolerance. The curve taken two to three weeks *after* operation shows that the blood-sugar reaches its maximum height within half an hour and has returned to normal value in an hour; the sugar-tolerance was therefore normal.

"Case 2 presents different features, for here the blood-sugar concentration half an hour after a dose of 50 g. of glucose is much higher (0·26) than before the graft, and it is accompanied by a pronounced glycosuria. The case is, however, complicated by the fact that he presents features of pituitary disease and the blood-sugar tracing resembles in some degree the curve described by MacLean under the name of 'lag' curve. Another test, repeated after an interval of three months, gives identical results.

"Taking these four cases into consideration, it seems reasonable to conclude that a definite effect has been produced on the mechanism of carbohydrate metabolism of patients who have been subjected to the operation of testicle grafting. In two of them the effect produced seems to be wearing off a little, but in the third the effect is maintained up to date. The natural assumption is that the change is due to the absorption of testicular hormone. The maximum effect is produced shortly after the implantation of the graft. It may be that a successful testicle graft, yielding testicular hormone, will cause a permanent alteration in the type of response to the ingestion of a certain amount of carbohydrate; and that a reversion to the former type of curve would mean absorption of the graft. In any case it is not desirable to attempt to interpret these changes any further, and it is best to keep an open mind on their significance until further cases and prolonged observation give us sufficient data to make our deductions."

THE LIMITATIONS OF THE TREATMENT OF TESTICULAR DEFICIENCY BY MEANS OF GRAFTS.

Although the results obtained from the treatment of testicular deficiency by means of grafts are distinctly promising, it must be remembered that there exist limitations to the use of the method quite apart from those imposed by the difficulty of obtaining material. In very few of the cases that present themselves for treatment with signs of testicular deficiency is the deficiency entirely confined to the testicle. In other words, we are seldom called upon to treat a frank state of hyper- or hypo-secretion of the testis. Especially is this true of those cases of congenital deficiency that are the result of some general pathological process taking place early in life. In such cases, even although only one gland may originally have been at fault, as the result of its failure other members of the endocrine group in time become affected. Tiernay has laid special emphasis on the importance of this reciprocal involvement of other glands, in a recent paper on the subject of pituitary disorders, and what is true of pituitary deficiencies is equally true of disorders of the testicular secretion. I cannot do better, therefore, than reproduce his own words on the subject: "We have found that many of the pituitary insufficiencies have been in their early stages apparently uniglandular and that after a variable length of time, usually a year, there almost constantly occurs a secondary reciprocal involvement of the thyroid and gonads. We have also found that after a reciprocal involvement, the diagnosis of which is based upon associated hormonic signs, there is less likelihood of sufficient response to therapy either single or compound."

An excellent example of this reciprocal involvement of other glands of internal secretion is furnished by No. 2 of the cases reported. In this case atrophy of the testis had been followed by involvement of the pituitary, so that the clinical picture was that of testicular deficiency associated with hypo-pituitarism rather than that of testicular insufficiency alone. For this reason the results obtained from a testicular transplant were limited and did not effect complete disappearance of symptoms. The same observations apply with even greater force to Cases 3 and 4, in which the pituitary gland was in all probability primarily at fault and the gonads only secondarily involved. To obtain the best results in these cases grafting should be combined with the use of extracts of the other glands involved.

Duration of Grafts.

A further question of the greatest importance in assessing the value of grafts in the treatment of testicular insufficiency is the question of their durability. Will a hetero-graft of testicular tissue that has been successfully vascularised survive indefinitely, or will it undergo slow absorption? To this question I am unable to give a positive answer based on my own work, as none of my operation cases are of sufficiently long standing to allow of deductions being made. Voronoff has stated that in one of his successful cases the improvement has been maintained for a period of four years, and he is not inclined to place a limit on the life of a graft. Personally I believe

that a hetero-graft, however complete its vascularisation may be, undergoes from the very beginning a process of absorption. I have arrived at this conclusion partly from a consideration of the behaviour of hetero-grafts in general, and partly from observations of my own cases. The time taken for a graft to become absorbed must, of course, vary in different cases, but I am inclined to think that a life of two years is the utmost that can be expected. This does not, of course, necessarily mean that at the end of that time the patient will relapse into the state in which he existed previous to his operation. Morris made the interesting observation that in one of his cases who possessed testicles, although atrophied ones, the insertion of a graft stimulated the growth of the patient's own testes, and that this enlargement was maintained even after the grafts were no longer palpable. A somewhat similar action may possibly be exerted on other endocrine tissue and the impetus given by the graft thus outlast its life. The probability, therefore, that grafts will in time become absorbed is not a valid argument against their use. It may, for instance, be possible by means of a transplant to assist a boy showing signs of eunuchoidism through the period of puberty, even although later the grafts may disappear. Lydston, who has been a pioneer in this work, has written in no undecided manner on the very topic: "It is my belief that practically all, if not all, subjects, if operated on at or about the usual age of puberty can be taken through puberty and will show sex development with corresponding secondary masculine sex characteristics approximating the normal more or less closely." I am in entire agreement with Lydston in this, provided the case be one of pure testicular deficiency and not one of hypo-pituitarism.

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THE RÔLE OF THE MUCOUS MEMBRANE IN DISEASES OF NOSE, THROAT, AND EAR.*

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COMPARING and contrasting the skin proper with the mucous membranes, or, as I should say, the inner skin, one cannot help being struck with the great attention that has always been and is still being paid to the skin; it has a history and a literature, and societies and journals devoted to its study. Investigation and research have made the skin a favourite field for work, whereas the mucous membrane or inner skin has suffered comparative neglect as regards systematic study as an organ and a system in the animal economy; and yet the part played by this inner skin is of paramount importance and far exceeds that of the skin proper as a body protector and preserver against the inroads of disease. For the functional activity of the mucous membrane it is indispensable that the surface should constantly maintain its natural moisture, and for this purpose a mucous secretion is continually being poured over it. Mucus is not the simple solution that we are apt to consider it, but is of very complex composition and extraordinary function. Its composition has not yet been elucidated. We know that it contains a protein radical and glucosamin—the nitrogen-containing carbohydrate of mucin, a non-fermentable sugar. This carbohydrate group is very rich in oxygen. Mucin also contains a very large amount of sulphur. It has now been proved that mucin with its wonderful chemical composition has a barrier action against the entrance of toxic ferments and bacteria into the system, and this in virtue of the fact that the nitrogen-containing carbohydrate is not fermentable, and is not affected by the oxidising and dissociating ferments of mammals. Mucin is also highly resistive to putrefaction, and it was affirmed by Cohnheim that "the peculiar physiological property of mucin makes the entrance of putrefactive bacteria a difficult matter, while the bactericidal properties also play a part.

One of the curious facts of pathology is that certain bacteria actually secrete a true mucin for their own protection against the attack of other bacteria. Mucin belongs to the amido group; its exact stereochemical position, being very intricate, has not yet been fully worked out. It is very rich in oxygen, however, and it is known that this oxygen is very loosely attached and can be, and is, readily parted with, and that it is in such a manner that enzymes (ferments) given off by virulent bacteria are destroyed and the body protected from their insidious and destructive ravages. The wide range and high value of mucin are therefore evident.

STRUCTURE AND FUNCTIONS OF MUCUS.

The structure of mucus in its singular complexity is enough in itself to support the belief that its functions are more intimate and subtle than that of a mere lubricant. The moist and sticky surface of the mucous membrane catches up the innumerable particles of dirt and bacteria that enter with the inhaled air. In order to carry out these purposes it is armed with two mechanisms of great value—one the secretion, mucus, of which we have just given a description, and the other the ciliary action of the mucous membrane. Once a stationary state becomes established, the bacteria and their toxins are likely to penetrate to the epithelial cells, and, by a solution of them through the production of enzymes—ferments—pass into the circulation. There is now experimental proof that in the "carrier" state when the body is protected from the onset of various pathogenic organisms it is the mucus surrounding the bacteria that restrains their virulence. This protection is not a real immunity in the essential meaning of the term, for its subjects often suffer an infection at a later date when the protective mucous barrier has gone. This explains why the deadly meningococcus and the deceptive diphtheria germ can rest in the naso-pharynx, throat, and nose, their host remaining immune meanwhile, but may be readily transmitted to another person not equally protected. The virulently-toxic Shiga's bacillus, in the same manner, can be lodged in the system for a long time without giving rise to toxic symptoms.

It is now 22 years since I first drew attention to the value of mucin as a therapeutical agent in two papers published in THE LANCET,[1] and research since that time has fully borne out its great usefulness.

THE EAR FROM THE ENTRANCE TO THE EUSTACHIAN TUBE UPWARDS.

In considering the mucous membrane and the part it plays in diseases affecting the various regions, we will first take that tract running from the pharyngeal end of the Eustachian tube up through the middle ear and on to the apex of the mastoid. The Eustachian tube and the tympanic cavity are lined by a common mucous membrane with a ciliated epithelium. The mucous membrane varies in its consistency, in the number of mucous glands and lymphatics, and in the kind of epithelium. From the lowest part of the Eustachian tube, where the mucous membrane is thick, it gradually becomes thinner and thinner right over the tympanic cavity through the aditus to the

* Abstract of an address delivered at the Central London Throat, Nose, and Ear Hospital.

[1] THE LANCET, 1901, ii., 972; 1902, i., 961.

lowest mastoid cells, where it is a muco-periosteum and contains neither mucous glands nor cilia. On the inner side of the membrana tympani it is a very thin delicate layer covered with squamous epithelium. The epithelium on the ossicle and tensor tympani and stapedius muscles is not ciliated. There are few mucous glands in the tympanic cavity, but throughout there is a distinct development of the lymphatic layer. At the pharyngeal end of the Eustachian tube, where it bulges into the pharynx, and for a third of its length upwards, there is a marked development of the mucous membrane; the latter is thick and vascular, and the lymphatics and mucous glands are well developed and numerous. At this part these structures constitute a veritable lymphatic gland surrounding the tube, and this acts as a guard to the entrance, effectually stopping, destroying, and carrying away any septic organisms that might try to work their way into the tympanic cavity from the naso-pharynx. Over the foramen rotundum the mucous lining is very delicate, as is the fibrous membrane that closes this opening, so much so that in life it is transparent, a thick mucous membrane would not aid the transmission of sound. At the entrance to the aditus there is a special fold of mucous membrane which practically makes the tympanum and the antrum independent cavities. This is often so well developed that mastoiditis may be present without otitis, or, as oftener happens, otitis without mastoiditis. The fact that the mucous lining of the antrum and mastoid cells is so thin as to constitute a muco-periosteum containing no mucous glands and having but very little underlying lymphatic layer explains what is familiar to us all—the rapid way in which sepsis can, and often does, spread in this region. In my experience, such cases of rapidly spreading sepsis with bone caries are most often met with in young adults. There may be an extraordinary degree of absorption of bone in the mastoid, especially of its inner shell, so that the whole process forms a single cavity bounded by dura mater and lateral sinus on the upper, inner, and posterior sides, while the outer wall resists perforation till late. Perforation (Bezold's) into the digastric fossa is common. In spite of this extensive destruction the temperature is usually normal, or but slightly raised. Peri-sinous abscess is very common, or the sinus may form part of the boundaries of a single large cavity. In one of my cases—a man of 40—the abscess within the mastoid communicated with a large peri-sinous abscess.

The sea of lymph in the submucous lymphatics of the middle ear and Eustachian tube doubtless communicates with the parilymph and endolymph, and in this way helps to maintain the tension in these situations, so essential for hearing and equilibration. The dragging action of the tensor tympani and stapedius muscles doubtless helps to pump this lymph on its course. Is it not likely that the connexion that has been shown to exist between middle and internal ear deafness has here an explanation? In otosclerosis, chronic catarrh of the middle ear, and chronic suppuration of the middle ear (residual) it is now found that there is an impairment of the labyrinthine function. This may be because through disturbance or cessation of this lymphatic circulation the tension in the perilymphatic and endolymphatic channels is impaired, and, therefore, the chance of the specialised epithelium in the organ of Corti, maculæ, and cristæ interpreting the vibrations of the waves of pressure is diminished. There can be little doubt that nearly all affections of the ear (especially now that nerve deafness is known to be largely influenced by middle-ear conditions) result from sepsis introduced from below and passing upwards into the Eustachian tube from a septic pharynx—a failure of the mucous and lymphatic structures, stationed at the lower end of the Eustachian tube, to protect the vulnerable middle ear.

After many years' experience I have come to the conclusion that chronic catarrh of the middle ear—that bugbear of otology—is a consequence of insidious sepsis, let into the tympanic cavity in this manner. This would cause irritation, for septic organisms and their products are exceedingly irritating to delicate mucous linings, especially if their virulence is not restrained by the presence of mucous secretion. These infections would also result not only in irritation and congestion of the mucous lining of the middle ear, but in desquamation of the superficial epithelial covering, ending in atrophy. It has often impressed itself upon me that even oto-sclerosis must be a consequence of sepsis. Once the mucous and lymphatic structures at the lower end of the Eustachian tubes are rendered useless, the passage is open, and tension not only in the middle ear, but also in the labyrinth, is reduced; nutrition of their structure is so altered that impairment and fixation follow.

NOSE AND NASO-PHARYNX.

In the nose and naso-pharynx the epithelial covering is everywhere ciliated except in the olfactory region proper, in the upper third of the nasal cavity. The lymphatic layer is also well developed throughout, and there is a great accession of it on the posterior wall of the naso-pharynx where adenoids accumulate. The lymphatic layer of the mucous membrane is also particularly well marked in the inferior turbinals, especially in the posterior half and on the posterior part of the nasal septum, in which situation mucous glands are specially abundant. The special functions of the mucus are pre-eminently displayed in the nose, where, being sticky, the mucus traps foreign bodies, dust, &c., and bacteria, entangles them, destroys them, dissolves them, and holds them till the phagocytes can come along and consume them. An efficient mucous membrane, then, lets nothing pass; and, if it did, whatever escapes would be blown upon the posterior wall of the naso-pharynx, and there caught in the same way as in the nose through which it had escaped.

Paget's investigations on the production of antibodies by the nasal mucous membrane which leads to destruction or neutralisation of the toxins of the tubercle bacillus are very remarkable, and well emphasise the high value of nose breathing in the prevention of respiratory diseases and the bactericidal properties of the secretions of the upper respiratory tract. Swabs taken from the nasal passages of students and nurses in consumptive wards are often found to contain tubercle bacilli, but tuberculosis of the nasal passages is quite rare. It is evident, therefore, that in the upper respiratory passage there is a bactericide capable of destroying these bacteria.

The mucous membrane of the nose is in one respect very different from that of the ear, in that it contains erectile tissue. The latter is absent in the Eustachian tube and tympanum; and just as much of our work in the ear results from the mucous lining being so thin, so also much of our work in the nose directly follows from the lining being thick and erectile, and thereby causing nasal obstruction, a very serious handicap in the fight against sepsis.

I should like to say a word about rhinitis sicca and nasal mucous polypi—two conditions frequently in our hands for treatment, and very common.

Rhinitis Sicca.—Rhinitis sicca—so called for want of a better name—or, as I should call it, hypomyxia-naso-pharyngia, the deficient secretion of mucus. This is, I think, much the commonest deviation from health of the nasal mucous membrane. The condition of the anterior half of the inferior turbinal is the criterion of the normal mucous membrane, and in health appears rosy-red, rotund, resilient, and moist. In rhinitis sicca it is pale, desiccated, crusty, and cobwebby—that is, strands of dry mucus pass from the septum to the turbinal. The rest of the nasal lining is more or less dry and crusty. This dry, and therefore functionless, condition of the mucous membrane of the nose frequently results in serious deterioration of health, since bacteria-laden dust is freely inhaled, passing unfiltered down into the lungs, and is a common precedent of tuberculosis. Moreover, normally over a pint of healthy mucus should pass down through the naso-pharynx to the œsophagus daily. In the absence of this these parts become desiccated,

with consequences which if prolonged over a lengthy period are many and varied, and always deteriorative. It is now recognised that man is becoming less and less hirsute. Nature seems to have anticipated that man would, in his multifarious occupations, be liable to have to respire all sorts of impure and bacteria-laden air; to combat the dangers incident to this respiration the nose is supplied with a most complete and efficient protective apparatus in the shape of the short stiff hairs lining the entrance of the nose. These hairs catch and hold dust and all debris from the air; and, after having been temporarily arrested, this debris is readily blown out again. Should such aerial flotsam and jetsam pass this air filter and be drawn, with the inspired air, into the middle chambers it would then be arrested and held by the mucous coating on the lining; and, most likely causing irritation, be violently expelled by setting up sneezing. This is how sneezing is beneficial, becoming a valuable protection by forcibly throwing out foreign material from the nose. Loss of hair on the external skin may be a matter of indifference to the human race, since we can readily replace its function by wearing extra clothing; but in the case of the nasal entrance, loss of hairy protection is a serious defect, enabling microbes freely to enter the nasal cavities—freedom of access which lays the body more readily open to bacterial attack. It is no less certain, however, that man, and especially woman, is rapidly becoming less and less mucose. Rhinitis sicca, or hypomyxia-naso-pharyngia, is becoming common. This means a dry nasal interior, the secretion from the nose being thin and watery—serous. In the absence of the sticky normal mucus the bacteria-trapping function of the nasal lining is lost, and its protection against inhaled particles diminished. The pint of mucous secretion that should be produced daily in the nasal spaces is in abeyance, and the moistening, protecting, and cleansing process that goes on through the passage of this amount of mucous discharge down over the naso-pharynx, oro-pharynx, laryngo-pharynx, and œsophagus ceases; thus these surfaces are exposed to irritation and become congested and inflamed, and malignant disease is likely also to arise as a result of prolonged epithelial irritation.

Nasal Mucous Polypi.—It is very noticeable that nasal mucous polypi always spring from the region of the middle turbinal or higher up, but never from the inferior turbinal. I have often told the students in my clinic that I would give £20 to anyone showing me a mucous polypus arising from the inferior turbinal. I think this immunity from polypi is due to two conditions—first, that the mucous covering on the inferior turbinals is much thicker and has many more mucous glands on it, being thus much less likely to become dry than the thinner lining of the middle turbinal; and secondly, because we inhale through the middle meatus, which is dried and irritated by the impact of the dust-laden inhaled air. The statement that there is always sepsis—even caries of the bone—at the spot from which the polypus springs I cannot accept. Again, we exhale through the inferior meatus, and the expired air saturated with water is constantly preventing the inferior turbinal from getting too dry, so dry that a mucous polypus might spring from it if irritation from dust, &c., were present. I am told by a friend who has travelled much in Russia that mucous polypi are very common in that country, almost every second person being affected. This is no doubt largely accounted for by the very sandy, dusty atmosphere, and the warm, dry, and impure air of the living rooms. Russia, when she has recovered from her present distressful state, is doubtless the field for our rising generation of naso-pharyngeal specialists.

The amount of dirt in the London atmosphere that the nose has to deal with and prevent from getting into the lungs is enormous. It is a fact that 5 million tons of coal are consumed in London annually for domestic purposes alone. It is calculated that as much as 90 tons of soot is a common quantity to be floating over London, and that when the wind is in the north dust is wafted down to us even from the Midlands. If we could roll away the clouds of smoke which daily hang over the homes of our people, we should by the same action make exiles and fugitives of many of our deadliest foes. It has been possible to create a smokeless New York, even a smokeless Essen. That London and other of our cities remain under this curse is proof only of our backwardness in making use of the knowledge which is now at our disposal. It will be agreed, I think, that the nose with a normal mucous lining is one of the chief gateways of health and happiness, and on its proper function depends both physical and mental efficiency.

MOUTH AND ORO-PHARYNX.

The mucous membrane of the mouth and oro-pharynx is covered with squamous epithelium thicker in some parts than in others, having in it comparatively few mucous glands, and those very minute. On the gums there are none; there are none on the dorsum of the tongue, none on the back of the pharynx; but there are mucous glands on the sides. The cavity of the mouth is largely dependent for its moisture and mucus on the efficient action of the salivary glands; and the oro-pharynx for its mucous coating and lubrication depends upon discharge coming down from the naso-pharynx. Dr. Sim Wallace was the first to emphasise the great value of mucus as an antiseptic and preventive of dental caries. Physicians have always laid great stress on the importance of looking at the tongue as a criterion of the proper performance of the gastric function. We have, as medical students, been schooled on this point, and the public expect the tongue to be looked at; it is a tradition, to neglect which would jeopardise a reputation for wisdom and carefulness. I think, however, that it would be much more helpful to look past the tongue at the posterior wall of the oro-pharynx and observe its coating, moisture, or dryness as an indication of the normal amount and quality of mucous secretion passing down from the naso-pharynx. If this surface is seen to be desiccated the stomach and œsophagus are not receiving an adequate amount of mucus to supplement their own supply, and should there be streaks of mucus adhering to the oro-pharyngeal posterior wall, it can be taken as a sure indication of a pathological change in the mucus-secreting function. Whether the tongue is clean or not is largely determined by the nature and consistency of the food and the amount of the salivary secretion. If the food is firm or hard, the attrition of the lingual dorsum on the surface of the palate keeps it clear of superfluous and deciduous epithelium, and so, what is called "clean." For a healthy, clean, aseptic mouth the chief requirements, therefore, are attrition, friction of the tongue, teeth, gums, and palate; and an abundant salivary secretion, one of the principal constituents of which is mucus, both as a lubricant and as a restrainer of sepsis. I consider that we do not realise sufficiently the value of saliva as the main antiseptic of the mouth and oro-pharynx. And it is also the chief lubricant and protection of the mucous lining.

The sublingual glands are entirely given up to the secretion of a mucous saliva. The submaxillary glands are principally mucus-secreting, although partially serous, while the parotid gland is entirely serous, secreting no mucus. Quarts of saliva are poured out into the mouth in the course of a day, and the total quantity of mucus thus secreted is very large.

In severe oral ulceration, ulcerative and necrotic stomatitis, Vincent's angina, and other intractable ulcerations of the mouth, it has been found very difficult to modify the bacterial flora by intensive treatment. This is due to the fact that the organisms found in the mouth have extended into its superficial layers, into crevices between the epithelial cells, and into the orifices of the mucous glands. These bacteria are very firmly lodged in the tissues, and chemicals applied to the mucous surfaces cannot effect sterilisation without also destroying the superficial layers of epithelium at the same time. The lymphatic layer of the mucous membrane is distinct in the mouth, although thin in the oro-pharynx, especially on the

posterior wall; but there are accumulations in places, emphatically so in the lingual and faucial tonsils. Both of these are simply a great thickening and heaping up of the lymphatic layers of the mucous membrane in the two situations. Over the tonsil the mucous membrane is very thin, being only a single layer of flattened cells; there are no mucous glands on the surface, and few on the tonsillar crypts. In both regions phagocytosis is very active, and the fact that the mucous covering is thin on the tonsil probably favours it. It is quite likely that pyorrhœa alveolaris is coincident with a shortage of salivary secretion, especially the more concentrated and viscid secretion of the sublingual and submaxillary glands. Pyorrhœa alveolaris is now considered by Goadby to be primarily a disease of the gums, owing to irritation and infection of the gum tissues around the necks of the teeth, and beginning with a mild but chronic infection of the gingival margin. I have recently observed two cases of salivary calculus in elderly people, when the mouth was very foul and there was much tartar on the teeth. The mouth in both was frequently very dry. It is safe to say that the salivary secretion was reduced; and it is not at all unlikely that this, and all the trouble (including the evident pyorrhœa) was due to salivary shortage.

In xerostoma, met with more commonly in women, where the mouth is dry and leathery and there is a great shortage of the salivary flow, the teeth are so affected that they crumble and fall out. This emphasises the invaluable rôle of the saliva, and especially the abundant mucin contained in it in the maintenance of oral hygiene. I think it is to be regretted that sialogogues have now largely gone out of fashion in our prescriptions; some of these I have found very useful, such as small doses of copper salts—ordering stout to be taken suffices as a sialogogue, as stout contains a small amount of copper salts. Jaborandi, and small doses of mercury, and potassium iodide, of course, are effective mouth-moisteners. Lobelia I have found useful in augmenting the salivary flow, and the sulphate in small doses often acts beneficially in asthma. This may be by modifying, and most likely augmenting, the mucous secretions which are lessened and perverted in this distressing affection.

THE CANCER PROBLEM.

Since three-quarters of all malignant disease arises on epithelial-covered surfaces, it is appropriate that a consideration of it should now command our attention. As before mentioned when discussing histological physiology of mucous membranes, everywhere in the healthy body there is found a separating material between the cells. Even the most closely approximated cells, such as the squamous cells on the surface of the vocal cords, are separated by intercellular cement material. Compare this state of things with the cells in an epithelioma. Here there is no separating substance whatever, but these cancer cells lie close together, and in the cell nests they are very firmly packed. Now this is a very striking contrast, and it is not at all unlikely that the rubbing shoulders, so to speak, of those cells sets up such a disturbance of the metabolism as to account for subsequent rapid division. Such cells have been said to be embryonic (rapidly dividing growing from within) and so the cancerous cell is supposed to have taken on the characteristics of the embryonic cell, and cancer is said to be a reversion to the embryonic condition. Certainly, the more the cancer cells resemble the embryonic cells, the more rapid the progress of their growth. In the ovum the cells divide with great rapidity after fertilisation has taken place. Symmetrical division goes on again and again until a mulberry-like mass of cells is formed—the morula. In this way arises a collection of small cells with no intercellular material whatever. A cavity soon appears in the morula, and the blastula is constituted—the cells now arranging themselves around the periphery and a group of cells forms at one pole, many of which are more irregular than those around the periphery. All are very rapidly dividing and soon become arranged in three layers—the ectoderm, the endoderm, and the mesoderm—constituting the blastoderm. The essential lesion of carcinoma is the penetration of cells into the surrounding tissues, but whether this new departure on the part of the cells is a result of a cellular change or of some alteration in the intercellular-resisting substance is not yet clear.

The probability is that there is a certain degree of both. In old age the intercellular material undergoes a wasting change, and as a result of this its resistive power against the ingrowth of epithelial cells is lessened and thus the onset of carcinoma is favoured, particularly as the overlying epithelium remains much longer active and thus there is an influence inducing the cells to penetrate inwards among the tissues. The centrosome, in cells on epithelial mucous surfaces, occupies that part of the cell nearest the surface and, therefore, the part most exposed to injury and irritation. The centrosome is the dynamic centre and plays the leading part in the division of the nucleus, the proliferation of the cell, and the regulation of movement.

Now, I believe that there is a long antecedent or precancerous stage in the development of cancer, and that during this time what occurs is a gradual removal of the intercellular cement material, and so bringing the cells themselves closer and closer together until they finally touch—juxtapose—and that this results in a friction or disturbance, and an irritation ending in a rapid cell division.

Perhaps the processes of irritation, such as occurs from paraffin and tar, which have resulted in the artificial production of cancer in mice and rats, act in such a way. In support of this contention, it is remarkable to note that cancer most often arises in regions where the epithelial cells are naturally surrounded most scantily by intercellular material—viz., on the skin surface, on the vocal chords, on the surface of the palate and its pillars, on the lips, &c., and in the breast.

It may be that two factors work towards the preparation of the tissues for the actual start of the carcinogenous change in any region, as I am persuaded from long years of study of cancer—first, gradual and continuous deterioration of health during which time the intercellular cement material, tissue-mucus, is absorbed or wasted; and secondly, a local change, most probably an irritant. That the cancerous growth is the result of some long-continued irritation is the oldest theory of all. The local production of cancer in mice and rats is a distinct advance. Researches on rats, in setting up the cancerous change on the squamous-celled surface of the stomach in the cardiac region are important, and prove that a surface covered with squamous cells is most susceptible, or, in other words, least resistant. This, I think, is due to the scanty intercellular material found in squamous covered surfaces. A new light was shed on cancer research when Johannes Fibiger, of Copenhagen, carried out his brilliant work on the production of gastric cancer in rats, showing that cancer was capable of being produced experimentally. In the sugar refineries of Copenhagen both cockroaches and rats swarm, and the rats eating the cockroaches developed a tumour in the cardiac end of the stomach (in this animal, covered with a squamous epithelium) which proved to be an epithelioma. The explanation of this result is that the larvæ of a nematode worm (thread-worm) pass a stage of development in the muscles of the cockroach, and this swallowed by the rat becomes fully developed in the squamous epithelium of the cardiac end of the stomach, thereby producing an epithelioma. Much has been done in the way of laboratory research, but experiment on animals, while helpful, is not going to induce us to lessen the intensity and incisiveness of our clinical work. I am very hopeful that much may yet be accomplished in our own specialty. We are warranted in such expectancy from the frequency with which the malady occurs in the throat, and the unique opportunity thus given us for clinical study.

A SIMPLE METHOD FOR THE PREPARATION OF INSULIN BY AQUEOUS EXTRACTION.

A Preliminary Communication

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THE investigations about to be described were undertaken with a view to determining whether any simplification could be effected in the method now in general use for the preparation of insulin. The method of Collip,[1] as modified by Dudley,[2] gives very satisfactory yields, but is admittedly expensive both from the point of view of alcohol and labour. For a five kilo batch of pancreas 13·5 litres of 95 per cent. alcohol, and 3 litres of absolute alcohol are required, whilst from the point of view of labour the supervision of an expert is required for practically the whole of the process which takes, on an average, about eight days.

In the first experiments of Banting and Best [3] water was used as an extracting fluid, but the yields were poor, owing to the unchecked action of destructive enzymes. After careful experiments alcohol was substituted for water, since it inhibited tryptic action, and at the same time extracted the active principle. From these experiments the method of Collip was elaborated. In a recent paper of Best and Scott [4] these writers refer to attempts at a more economical water extraction process, but out of 150 experiments made by them their best yields only amounted to a quarter of that obtained by their alcohol process. Perhaps the poor results can be attributed to prolonged exposure to tryptic action during the filtrations which, we have found, present many difficulties. Allen, Piper, Kimball, and Murlin [5] published a rapid method of insulin extraction using 1/5 N HCl as an extractor. They do not state their yields, however. We have tried this method but with little success.

Reduction of Tryptic Action: Separation of Insulin from Pancreatic Proteins.

Remembering that insulin is freely soluble in water and that this fluid forms its natural medium, we thought it highly probable that aqueous extraction would really be the ideal method, provided that tryptic action could be reduced to a minimum. In order that a water extraction process may give a satisfactory yield, the following points are essential. Firstly, reduction of tryptic action to a minimum; and secondly, efficient separation of insulin from the pancreatic proteins.

The first difficulty can be overcome by reducing the time of extraction to a minimum consistent with thorough extraction, and at the same time employing some inhibitory substance in the extracting fluid. Collip had suggested that formic acid was advantageous, hence it was thought that its addition to the extracting fluid would help in the inhibition of tryptic action. The second question regarding selective separation of insulin from the relatively enormous quantity of protein associated with it presents much greater difficulties.

The solution to this problem was indicated by the results of some experiments carried out in these laboratories on the relative solubility of insulin and protein picrates in organic solvents. Dudley [2] had previously shown that insulin picrate is highly insoluble in water. It was therefore a matter of great interest when we found that whilst the picrates of most proteins are sparingly soluble in moist acetone or alcohol, insulin picrate dissolves in these solvents with unusual readiness.* This fact overcomes the difficulty of separating insulin picrate in a highly concentrated form from the bulk of extraneous protein picrates precipitated with it; whilst Dudley's purification method provides the key to the regeneration of its hydrochloride from insulin picrate.

Experiments were at once commenced with a view to determining whether this could not be made the basis of a new process. Outlined briefly, the method consists of extracting the pancreas with aqueous chilled formic acid, and precipitating all the proteins from the fluid residue by the addition of saturated aqueous picric acid. The precipitate is filtered off and the moist picrates are extracted with acetone, thus dissolving out the insulin picrate. The acetone solution is filtered off, and the contained picrate precipitated by dilution with water and picric acid. This crude insulin picrate is filtered off and dissolved in acid alcohol after the method of Dudley, and, on dilution with acetone, the hydrochloride separates.

Technique of Method.

After many experiments and trials, the following method has been found to yield satisfactory results.

First Day.—Freshly collected pancreas is dissected to remove fat and extraneous tissue and weighed. The following description applies to a 5 kg. batch.

The pancreas is minced into 2·5 litres of 1 per cent. aqueous formic acid, which has been previously chilled to about −3° C. The mixture is well stirred at intervals, and allowed to stand for 10 to 20 minutes, after which it is poured on to a fine sieve, and as much liquid as possible is pressed out by hand. The fluid is received into an equal volume of saturated aqueous picric acid solution. The solid material retained by the sieve is pressed in "jean" and the expressed liquid added to the picric acid mixture. The solid material is removed from the press and is reminced into a further 2·5 litres of chilled formic acid solution, and the above process repeated, using a further quantity of the picric acid solution. This procedure is repeated a third time, giving in all a total volume of about 15 litres of the picric acid mixture. After the mixture has been well stirred and allowed to stand for ten minutes a portion is removed and filtered through a small folded filter and the clear filtrate tested for complete precipitation by the addition of more picric acid solution. Should a precipitate form, more picric is added to the main bulk. The precipitated picrates are then collected by filtration.

We have found the most rapid method to be preliminary filtration through folded Chardin filter papers, from which the wet precipitate is transferred to Buchner funnels. The total time taken by this procedure should not exceed two hours. The moist picrates are extracted two or three times by stirring thoroughly with acetone (about a litre for each extraction), pouring the pasty mass on to a folded Chardin filter paper, and finally pressing out through "jean." The clear acetone extract, which is of a dark-brown colour, is diluted with an equal volume of water. The precipitation of the picrate is completed by the addition of one volume of saturated aqueous picric acid, and the precipitate is allowed to settle overnight. This completes the first day's operations.

Second Day.—The clear, supernatant fluid is siphoned off and the picrate collected on a Buchner funnel. It occasionally happens that the picrate rises to the surface of the liquid, but this does not cause any inconvenience. It is washed with a dilute solution of picric acid and the moist picrate is converted into the hydrochloride by Dudley's method. For this purpose it is dissolved in acid alcohol prepared by mixing 25 c.cm. of 3N aqueous HCl with 75 c.cm. of alcohol. 10 to 20 c.cm. of this mixture are usually required for each gramme of picrate. By careful

* While this paper was being prepared for publication the authors learned in a private communication from Dr. Dudley that he had independently observed the solubility of insulin picrate in mixtures of water and alcohol, and that a paper by him, in which this observation is recorded, is now in the press.

rubbing with a glass rod, a turbid solution of a dark-brown colour is obtained, from which the hydrochloride is precipitated by the addition of 10 to 20 volumes of acetone. The hydrochloride is allowed to settle, and the clear supernatant fluid is decanted. The remainder is poured on to a Buchner funnel and the precipitate is washed with acetone until free from picric acid, and finally with dry ether. It is then dried in a vacuum desiccator overnight. The crude hydrochloride so obtained is a perfectly white, non-hygroscopic, amorphous powder, the rabbit unit of which usually lies between 3 to 6 mg. In some recent batches the rabbit unit has been as low as 1·5 to 2 mg.

Results.

The following are typical of the results obtained:—

1. *Exp. 8.*—Ox pancreas. Six kilos of dissected pancreas yielded 6·02 g. of hydrochloride. This was standardised in the usual method; 4, 6, and 8 mg. being given, and the rabbit unit was found to be 4 mg.

Rabbit No. 6, weight 2·2 kg. Blood taken at 7 P.M., 110 mg. per cent. Injection of 4 mg. in 1 c.cm. immediately after bleeding. Blood taken at 8 P.M., 59, at 9 P.M., 45, at 10 P.M., 48 mg. per cent. The total rabbit number of units was therefore 1504—i.e., 250 rabbit units per kg. The hydrochloride was then purified by Dudley's picrate process, and yielded 0·705 g. of pure hydrochloride. The rabbit unit of this was determined in the usual manner, 0·5, 1, and 1·5 mg. being given. It was found that 0·5 mg. was the required dose.

Rabbit No. 10, weight 2 kg. Blood taken 11 A.M., 125 mg. per cent. 0·5 mg. given in 1 c.cm. immediately after. Blood taken at 12.5 P.M., 33, at 12.55 P.M., 30, at 2 P.M., 42 mg. per cent. The total yield of purified hydrochloride, with a rabbit dose of 0·5 mg., was therefore 1400 rabbit units—i.e., 233 rabbit units per kg.

2. *Exp. 7.*—Pig pancreas. Two kilos of dissected pancreas. Owing to the fatty nature fully 20 minutes was allowed for each extraction. The yield of insulin was 1·346 g. On standardisation, the rabbit unit was 2 mg.; 1·5, 2, and 6 mg. were given to the rabbits.

Rabbit No. 5, weight 2 kg. Blood taken 2.30 P.M., 140 mg. per cent. 2 mg. immediately injected. Blood taken at 3.25 P.M., 66, at 4.30 P.M., 34, at 6 P.M., 40·8 mg. per cent. Convulsions at 4.30 P.M. The total yield was therefore 673 rabbit units—i.e., 337 units per kg. On purification by Dudley's method, yielded 0·232 g. of hydrochloride. The rabbit unit was found to be 0·3 mg.; 0·3, 0·6, and 1·0 mg. were given.

Rabbit No. 4, weight 2·3 kg. Blood taken at 10.15 A.M., 132 mg. per cent. Injection immediately of 0·3 mg. in 1 c.cm. Blood at 11.15 A.M., 34, at 12.15, 27, at 1.40, 55 mg. per cent. The total yield was therefore 773 rabbit units, or 386 per kg. This, it will be noted, is higher than the crude yield, the probable explanation being due to the inaccuracy of the rabbit methods of standardisation.

3. *Exp. 4.*—Horse pancreas. 4·5 kg. dissected pancreas extracted twice with 3 litres of 1 per cent. aqueous formic acid, yield of crude insulin 10·06 g. Rabbit unit 10 mg.; 10, 30, and 50 mg. were used.

Rabbit No. 3, weight 2·6 kg. Blood at 10.30, sugar 142 mg. per cent. Immediate injection of 10 mg. in 1 c.cm. Blood at 11.35, sugar 64, at 12.30, sugar 36, at 1.15, sugar 40 mg. per cent. The rabbit with 50 mg. had violent convulsions after two hours. The yield was therefore 1060 rabbit units—i.e., 235 units per kg. The crude hydrochloride was used for other purposes and was not purified.

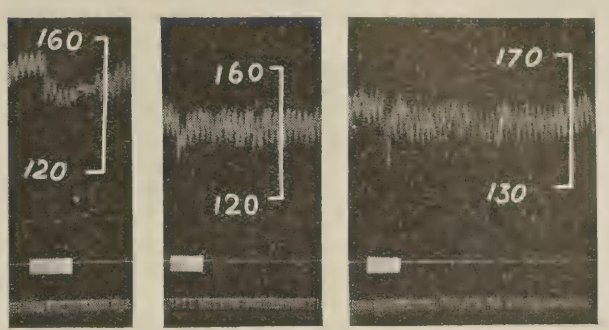
We have been able to repeat these experiments with consistent results, of which the above are typical instances. The yield has been steadily increasing with greater familiarity with the method.

As this process depends on quite different principles from the standard methods in use at the present time, it was thought necessary to test the possibility of a depressor effect. Prof. Swale Vincent and Dr. S. Wright very kindly performed blood-pressure experiments in the usual manner on two cats, the results of which we publish with their consent. The crude insulin hydrochloride made by this method was found to cause a very slight fall in blood pressure when injected intravenously. Twenty mg. containing 5 rabbit units caused a fall of 3 to 4 mm. (Tracing 1), but the purified hydrochloride was practically without depressor effect, as shown in Tracings No. 2 and 3. No. 2 represents the effect of 10 mg., No. 3 of 5 mg. of the purified hydrochloride, corresponding to 20 and 10 rabbit units respectively. The signal marks the time of injection.

These results are similar to those described by Dudley except in so far that the crude hydrochloride shows less depressor effect than crude insulin prepared by the alcohol process. Another important point is the question as to whether the final product contains any trypsin. To test this a previously standardised solution of hydrochloride was left in a 37° C. incubator overnight, and was re-standardised after incubation. The following are the details of the experiment.

The insulin made in Experiment 8 was used (see above). The rabbit unit, before incubation, was 0·5 mg. After incubation 1 c.cm., containing 0·5 mg., was injected into a rabbit with the following results: Blood at 11.5 A.M. 135 mg. per cent.; injection immediately after, blood at 12.5 P.M. 50, at 1 P.M. 40, at 2 P.M. 40 mg. per cent. From this experiment it is safe to conclude that the product is stable.

Blood-Pressure Tracings.



(1) crude ox 20 mg.; (2) pure ox 2 c.cm.; (3) pure ox 0·5 c.cm.

Insulin prepared by this method has been employed clinically on four human subjects and up to the present has been found quite satisfactory. No local reaction has been noted.

Conclusion.

This is intended merely as a preliminary communication. Many possible modifications suggest themselves. For example, improved yields might be obtained by distilling off in vacuo the acetone from the acetone picrate solution. Also the optimum concentration of acetone for the extraction of the picrates is now under investigation. From some experiments now in progress it appears that the insulin picrate might be fractionally precipitated from the acetone solution, thus yielding a purer product. Promising results have been obtained by alcohol and acetone alcohol extraction of the picrates. Modifications in the extracting fluid are also being investigated.

The object of publishing this preliminary note is to describe a workable water extraction process as an alternative to the lengthy and extensive alcohol extraction methods. The cost of materials in the present process is very small compared with that of the alcohol method, and the crude product can be prepared with ease in two days.

We wish to express our appreciation for the generous support of the Cancer and General Research Committee of the Middlesex Hospital. We have been in communication with Dr. Dale and Dr. Dudley of the scientific staff of the Medical Research Council and wish to express our thanks to them for their interest in this work, for information concerning details, at present in the press, of the method for the regeneration of the hydrochloride (included by their permission), and for many helpful suggestions with regard to the testing of the final product. The Medical Research Council also kindly provided facilities for the supply of pancreas used in these experiments.

References.—1. Collip, J. B., 1923: Jour. Biol. Chem., lv. 2. Dudley, H. W., 1923: Biochem. Jour., xvii., 376. 3. Banting, F. G., and Best, C. H., 1921 to 1922: Jour. Lab. and Clin. Med., vii., 464. 4. Best, C. H., and Scott, D. A., 1923: Jour. Biol. Chem., lvii., 709. 5. Allen, Piper, Kimball, and Murlin, 1923: Proc. Soc. Exp. Biol. and Med., xx., 519.

THE USE OF THE X RAYS IN ANTE-NATAL WORK.

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IF asked to name the besetting difficulty of the obstetrician engaged to attend a woman having her first baby we should describe it as the satisfaction of his own conscience that there was sufficient room for the baby's head to pass through the maternal passages. Anything that can lighten his burden in this direction achieves great public service and deserves the greatest publicity.

According to text-books, mensuration of the female pelvis is a comparatively easy matter, but anyone whose task is to be constantly endeavouring to estimate the relative sizes of the baby's head to the bony pelvis, very soon arrives at a different conclusion. The administration of an anæsthetic is recommended in doubtful cases, so that with a relaxed abdominal wall one is more likely to be able to ascertain whether the head will enter the pelvic brim or not. But even here, we have found it most difficult in fat subjects, with a quantity of liquor amnii, to ascertain with anything like accuracy what was the true condition of affairs. It has been laid down by a well-known authority that often the only course to be adopted in borderline or doubtful cases is to allow a woman to go into labour and "wait and see." If serious difficulty is encountered, it is then one's duty to warn the mother that in future labours she will have either to submit to a Cæsarean section at full term or have an induction at the eighth month. Now, with the aid of X rays, a ready and easy means is provided for obtaining accurate knowledge of the size of the baby's head relative to that of the maternal pelvis. A glance at the illustrations, which have been traced from the radiogram obtained, will show that this is so.

FIG. 1.

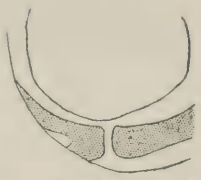


FIG. 2.

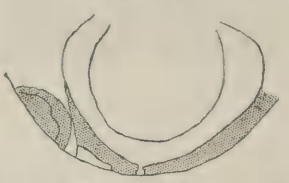


FIG. 3.

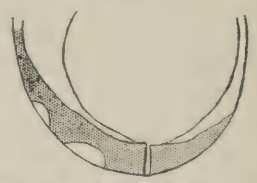
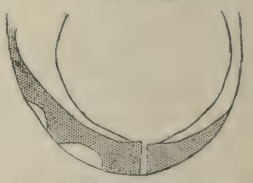


FIG. 4.



Diagrams traced from radiograms of the condition described in the text. Fig. 1 shows the head lying just above the pelvic brim. Figs. 2 and 3 show adequate disparity between the child's head and the pelvis. Fig. 4 shows that although the head is lying above the pelvic brim there is ample room for its passage into the cavity.

An Illustrative Case.

The subject from whom Fig. 1 was obtained was a very fat and apprehensive female. It was extremely difficult to know what the presentation was. There was nothing to be felt per vaginam, for nothing had entered the brim. From abdominal palpation we thought it was a breech, but were not certain, as there was an enormous amount of fat, fluid, and fussiness. We had her X rayed and nothing indicative of the head was seen below, so we were confirmed in our belief that the case was a pelvic presentation. We then did a version by external manipulation and applied a tight abdominal binder. The next X ray picture (Fig. 1) showed that our manipulations had been successful, for the head here is now lying just above the pelvic brim. Without the aid of the X rays we were up against this difficulty. There was just the possibility of the presentation being cephalic, and we were loath to do a version in those circumstances, for there might be a chance of bringing about the very thing it was our endeavour to avoid. Without the aid of the X ray we confess we should have allowed the woman to go into labour with the baby presenting by the breech—hoping that our suspicions were not correct. That would have entailed extra risk to both mother and child. A breech often means for the mother a bad perineal laceration, sometimes involving the rectum, and for the child premature inspiration and the swallowing of amniotic fluid with its concomitant risks. As it was, the result of the birth was in every way satisfactory except for details now to be mentioned peculiar to this particular case.

The patient had entered the home in order to have twilight sleep administered. She waited for five weeks, and, as nothing happened, and as she had entered the tenth month since the first day of her last period, a few bougies were introduced under anæsthesia, and labour started 12 hours later. As is usual with induction cases, labour is inclined to be slow and tedious, and for this reason twilight sleep is contra-indicated in such cases. The birth of the head and shoulders showed that the presentation was a left occiput anterior. There was no tear of the perineum, and the child was in every way normal and uninjured. It is a useful preliminary to the introduction of bougies to give injections of pituitrin, 0·5 c.cm. night and morning for three consecutive days prior to their introduction.

Cases Appropriate for This Method.

Our invariable custom now in a case about which we entertain any doubt—and to us there is always an element of doubt about any case of a primipara where the head is still above the brim of the pelvis during the last two weeks—is to have her X rayed. The knowledge so gained has proved of the greatest possible assistance. It is with a renewed sense of confidence and security that we then allow such a case to go into labour when the X ray has depicted an adequate disparity between the child's head and the pelvis, as, for instance, in Figs. 2 and 3. Only once in a fairly large number of cases now have we had reason to be at all disappointed with the X ray findings. Fig. 4 shows that although the head is lying above the pelvic brim there yet appears to be ample room for its passage into the cavity. We also believed so at the time, but subsequent events proved otherwise for there was a rather prominent sacral promontory. This entailed the application of forceps and a fairly hard tussle in order to get a well-ossified head past the obstruction. This difficulty has now been largely overcome by taking the photograph at a different angle, so that a view is obtained more directly down into the pelvis instead of a merely transverse view of the inlet, which can be so misleading when a well-marked promontory of the sacrum exists. A means now also exists of taking a radiogram of the outlet.

Another point about an X ray photograph is that some idea is obtained as to the amount of ossification the head has undergone, and that may be a real help in coming to some conclusion as to whether the child is overdue. It will be by the acquisition of this more accurate knowledge that X ray pictures undoubtedly afford, that the adoption of procedures suitable for particular cases will be more practised, and will render less exacting the life of the obstetrician.

Since writing on the subject of X rays in obstetric practice in 1922 [1] one of us (E. W. H. S.) has had the

[1] THE LANCET, 1922 i., 860.

opportunity of examining many pregnant women with X rays. The technical difficulties have disappeared with practice, and it is now a quick and simple process to give the obstetrician the few simple facts which conduce to safe delivery. Formerly much time has been spent in devising a system of pelvimetry, but however accurately the pelvis was measured, we were still left in doubt as to the size of the head. What really matters is not the absolute but the relative measurements of head and pelvis; and these measurements are readily obtained by radiography, for it needs no special training to say whether the head will or will not pass through the pelvic canal.

We do not think we are overstating the case when we say that this is the only method yet discovered which can clear up all doubts on the subject. One of us (C. H. S. H.), who has had more than usual opportunities of judging, can testify to the value of this method regarding the position of the fœtus. As we have pointed out before, there is not the slightest risk to mother or child, the X ray exposure merely being that of any ordinary body examination, the fœtus being exceptionally well protected by the fluid. Furthermore, newly-born babies show complete immunity to ordinary X ray exposure. In 25 years' experience, one of use (E. W. H. S.) has never seen any X ray reaction, although one has continually to examine babies for swallowed foreign bodies, pyloric obstruction, or other causes. Another attraction, perhaps not a very important one, is that the examination is devoid of any of the disagreeableness associated with manual manipulation.

Regarding the time at which ossification makes the fœtus visible, we are of opinion that this will vary considerably. A recent case, systematically watched from the third month, only became visible at the beginning of the seventh month. Stereoscopy has proved of value in a few cases, and it is a matter of extraordinary interest to see the fœtal head and the surrounding bones in relief.

Clinical and Laboratory Notes.

NOTES ON TWO CASES OF HÆMOPERITONEUM DUE TO RUPTURE OF BLOOD-VESSELS IN THE GASTRO-SPLENIC OMENTUM.

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HÆMOPERITONEUM due to rupture of the blood-vessels in the gastro-splenic omentum following on an external injury is a rare occurrence; and these cases are recorded as they possess many points of similarity and general interest.

CASE 1.—Female, aged 5, admitted to the West London Hospital on Dec. 3rd, 1923, in a collapsed condition. This little girl was run over in the street by a milk-cart, the wheel of which passed over her abdomen.

Condition on Admission.—She was brought to hospital half an hour after the accident. Her pulse was then 160 and almost imperceptible at the wrist. Temperature 96° F., respirations—very shallow and rapid—about 44 to the minute. The child was dyspnœic, cyanosed, and restless. Pupils widely dilated. Many superficial abrasions were present. Small cut over right iliac fossa. Examination revealed no fracture of ribs, spine, or limbs. Thorax normal. The abdomen was "board-like" in its rigidity, and tender all over, but particularly on the left side: Shifting dullness detected in left flank. No decrease of liver dullness. Urine clear. As the patient appeared to be rapidly sinking, immediate cœliotomy was decided upon.

Operation.—This was performed about one hour after the accident, under ether, gas, and oxygen anæsthesia. Right paramedian incision 4 inches long. Peritoneum full of fresh blood, contained some large semi-solid clots in pelvis. The various portions of the gastro-intestinal tract were systematically examined and found to be normal. Urinary bladder, liver, and renal areas appeared intact. A small tear, however, was located in the gastro-splenic omentum, and a small spurting blood-vessel was identified, seized with pressure forceps, and ligatured. The abdominal cavity was then washed out free of all blood and clots, and about half a pint of hot normal saline was allowed to remain inside. The wound was closed up in the usual manner. During the operation 1 pint of normal saline was administered subcutaneously; and 1/120 gr. of strychnine hydrochloride was injected into the left ventricle during a temporary cessation of the heart's beat.

Although the patient was practicaly moribund after the operation, she rallied gallantly, and after withstanding a severe attack of acute bronchitis, made a good recovery.

CASE 2.—Male, aged 15, was "run over" by a taxi-cab whilst wheeling a barrow. He stated that one wheel passed over his abdomen. He was brought to the West London Hospital on Nov. 12th, 1923, about an hour after the accident, when he complained of severe abdominal pain, thirst, and difficulty in breathing.

Condition on Admission.—Temperature 97° F., pulse 112, respirations 22. The patient was very pale, restless, slightly cyanosed, dyspnœic, and sweating freely. Nothing abnormal detected in thorax. No clinical evidence of any fracture. Epigastrium very rigid and tender. Shifting dullness detected. Catheter passed. Urine normal. Five hours later, T. 97°, P. 130, R. 30. Vomited once. No blood in vomit. Rigidity of abdominal muscles more marked. Per rectum, tender.

Operation.—Ten hours after accident, under gas and oxygen anæsthesia. Right paramedian incision 3½ inches in length. Abdomen contained fresh blood and some blood clots. All abdominal viscera examined found to be intact. A diffuse bleeding area was discovered in gastro-splenic omentum. This area was firmly packed with gauze, one end of which was brought out into the left flank through a separate "stab" wound. The abdomen was then closed after removal of the large blood clots. The gauze packing was removed after 48 hours.

This patient made a gratifying recovery, and left hospital a fortnight after his operation. This case (No. 2) was admitted under the care of Mr. Donald Armour, and I am indebted to him for his kind permission in allowing me to publish his notes.

A CASE OF SMALL SUB-PERIOSTEAL FIBROMA OF THE TIBIA.

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THIS case of small sub-periosteal fibroma of the tibia caused much pain in the leg and localised tenderness.

A woman, aged 24, was admitted to Oakbank Hospital complaining of dull aching pain and slight swelling of the right lower limb of one year's duration. The pain, which was most marked over lower third of tibia, was also experienced in the hip- and knee-joints on movement, and was increased by the pressure of the bedclothes. Examination was negative save that the leg, which appeared to be slightly swollen, but did not pit on pressure, was exquisitely tender about the junction of the middle and lower third of the tibia. X ray photographs showed no abnormality of the bone, the joints appeared quite normal, and the Wassermann reaction was negative. Rest in bed did not alleviate the symptoms.

Operation.—An exploratory incision was made over the tender spot, and a small hard tumour, the size of a lentil, was removed from a depression on the surface of the tibia, underneath the periosteum.

The pathological report stated that the tumour presented the structure of a fibroma, with interlacing bundles.

The patient made a perfect recovery, the pain and swelling disappearing entirely, so that she is now fit for her regular work.

I am indebted to Dr. Janet A. O. Weir, resident at Oakbank Hospital, for the preparation of the report on this case.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

A MEETING of this Society was held at 11, Chandos-street, Cavendish-square, W., on Feb. 11th, Dr. HERBERT SPENCER being in the chair, when a discussion was held on the

General Symptoms and Remote Manifestations of Common Affections of the Nasopharynx, the Nasal Accessory Sinuses, and the Throat.

Mr. HERBERT TILLEY, in opening the discussion, said that he would limit his remarks to conditions of inflammatory origin, and largely restricted himself to a demonstration by lantern-slides of the chief points of interest in his communication. Diseases of the nasopharynx, he said, were largely the pathological conditions which affected the lymphoid tissue of the post-nasal space. The well-defined but anatomically connected deposits of lymphoid or adenoid tissue grouped around the nasopharyngeal and faucial regions, forming what was known as Waldeyer's ring comprised the lymphoid tissue of the nasopharynx, the palatine or faucial tonsils, and the lingual tonsils. Lymphatic vessels passed from each of these to well-defined groups of cervical glands in the anterior or posterior triangles of the neck. There were also, in children, up to the third or fourth year, two pairs of lymphatic glands between the posterior wall of the pharynx and the anterior surface of the second and third cervical vertebræ. The common form of retropharyngeal abscess was the result of inflammation and suppuration in these glands. Histologically these lymphoid structures were essentially identical, and pathological conditions were rarely limited to any one of them. It was well-known that these aggregations were normal and well-defined structures in the earlier years of childhood, and that they exhibited a marked tendency to involution about the age of puberty and during the period of adolescence, but it was often forgotten that such a change might not take place, and consequently pathological conditions of these lymphoid collections were not uncommon in adult life. Their function scarcely came within the title of the discussion, but had an important bearing upon it.

Amongst other contributions the work of Kenelm Digby, Good (Chicago), and Dudley (Medical Research Council) went far to prove that the phagocytes of the tonsils, Peyer's patches and other sub-epithelial solitary lymph glands were continually ingesting the adjacent bacteria in the nasal and alimentary channels, and thereby constantly producing a healthily acquired immunity against various infections. It would be an extremely valuable piece of information if the medical officers of fever hospitals could show what sort of response to infection has been made by patients whose tonsils and adenoids had been completely removed in comparison with those who still possessed a normal amount of those tissues.

The lymphoid tonsillar deposits were well-developed in children. Their reaction to infection, as well as that of their associated cervical glands, suggested that they acted as protective structures in the first and second "lines of defence" respectively. At varying periods of time after complete removal of the faucial tonsils their recesses were occasionally seen to be partially occupied by lymphoid tissue which had grown up from the adjacent lingual tonsils. These were not a recurrence, but simply a pushing up of tissue into that place. In other instances prominent longitudinal deposits of a similar nature occupied the lateral walls of the pharynx. Quite recently he had seen a boy, aged 10, who four years before had his adenoids removed and tonsils enucleated. On the posterior pharyngeal wall there were the largest "granulations" of lymphoid tissue he had ever seen, which were probably the cause of the chronic "dry cough" from which relief was sought. Nature, apparently, had some very definite reason for placing sub-epithelial lymphatic tissue in those situations; thus such structures should not be sacrificed without more consideration than is often given to the question of their removal. Whether the constituents of Waldeyer's ring furnished an internal secretion akin to those of the endocrine glands was a view at present based rather upon theoretical considerations than on clinical observation and experience.

Effects of Inflammation.

With regard to the evil results which may follow when pathological conditions affect any one or more of the constituents of the lymphatic ring, the chief interest centred around the effects produced by inflammation arising from infection by pathogenic or pyogenic organisms, or both. The most frequent result, and especially after recurrent attacks of inflammation, was that hypertrophy of the lymphoid tissue known as "adenoids and tonsils"—i.e., the existence of an abnormal amount of lymphoid tissue in the nasopharynx and in the recesses between the faucial pillars. While hyperplasia was the usual result of inflammation during childhood it was important to bear in mind that pathological conditions might exist *without* hypertrophic changes, in which case the remoter manifestations were often more prominent than the local evidences of disease. Such considerations rendered it easier to answer the question, "What do we mean by *diseased* tonsils and adenoids?" The pathologist might hold that the mere presence of purulent debris and micro-organisms in their crypts and recesses was only an expression of physiological activity, while epithelial abrasions and the existence of polymorphonuclear leucocytes should be regarded as a surer sign of disease. The practical clinician would probably, and, he thought, rightly, maintain that the question could be answered only by an investigation of the history of the symptoms and of all the factors presented by the individual case.

Adenoids.

It was a common experience to meet this affection without a corresponding hypertrophy of the faucial tonsils, but less frequent to find the latter condition without some overgrowth of the nasopharyngeal lymphoid tissue. The general symptoms caused by adenoids might be divided into three categories according to the most prominent type of symptoms produced—viz.: (1) Those which indicate obstruction of the upper air passages; (2) local or remote symptoms of infection; (1) disturbance of reflex origin.

The Throat.

The commoner affections of the throat were due to inflammation of the palatine or faucial tonsils. The general symptoms of the commoner types of acute inflammation or tonsillitis were well known; their clinical manifestations were determined by the nature and virulence of the infecting organisms, their site of entry, and the resisting power of the patient. Other things being equal, the local and constitutional symptoms would be more severe should the predominating organism be a virulent type of streptococcus than in the case of staphylococcal or pneumococcal infection. The site of invasion had led to the recognition of at least three types of acute tonsillitis: (1) lacunar tonsillitis, where the brunt of the inflammation affects the crypts or lacunæ (often spoken of as "ulcerated sore throat"); (2) parenchymatous tonsillitis, in which the lymphoid follicles were acutely inflamed; (3) peritonsillitis or quinsy, where, while the tonsil was always inflamed, the characteristic lesion was inflammation and suppuration in the cellular tissues outside the capsule of the tonsil terminating in an abscess. This usually "pointed" in the soft palate above and to the outer side of the tonsil.

It was usual to recognise at least three types of chronic inflammation—viz., (1) chronic lacunar tonsillitis, where the crypts were filled with inflam-

matory products and swarming with micro-organisms; (2) hyperplasia of the lymphoid follicles, which produced large, soft tonsils of varying size and shape; (3) fibroid degeneration, in which connective tissue preponderated at the expense of the lymphoid elements.

Tuberculosis of the Tonsils.

As was the case in adenoids, tuberculosis of the tonsils was not infrequent, being latent and exhibiting no clinical signs of its presence. Philip Mitchell stated that of 64 children with tuberculous glands in the neck, 24 showed histological evidence of tuberculosis of the tonsils. The remoter manifestations of chronic tonsillitis were second only in importance to infective conditions of the teeth. In addition to ill-defined symptoms of impaired general health many definite and localised lesions had been proved to be due to a focus of infection in the tonsils. Such was the case with respect to fibrositis, myositis, and chronic arthritis.

The Nasal Accessory Sinuses.

These comprised the maxillary, ethmoid, frontal, and sphenoidal sinuses. The most common affections of these air-cells resulted from invasion by infective organisms, and the consequent inflammation assumed an acute, subacute, or chronic form. If the nasal accessory sinuses were methodically investigated during the post-mortem examinations of all cases of acute meningitis it would be found that a large number were the result of unsuspected infection from the sphenoidal and ethmoidal air-cells. Concerning the remoter manifestations of accessory sinus disease in adults it was his experience that gastric, pulmonary, and ocular symptoms are more frequent than cardiac, muscular, or arthritic complications. The constant swallowing or inhalation of septic matter is probably responsible for the first two. The pulmonary affections referred to are chronic bronchial catarrh, bronchitis, and not infrequently asthma. In consulting his physician for these complaints the patient often made no mention of a previous "chronic nasal catarrh," which only caused an inconvenience, because to him the pulmonary trouble is the real grievance. The great majority of chronic nasal catarrhs were really muco-purulent discharges from the nasal sinuses, and the infective micro-organisms which caused them would often be found in the patient's expectoration. Still more important was the fact that if the source of infection be removed its complications in the lower air-passages would often disappear without any special treatment.

Discussion.

The PRESIDENT expressed his appreciation of the caution advised by Mr. Tilley; in view of the tortuous cavities which had been so well illustrated upon the screen, operation in these cases was very difficult, and treatment of the conditions referred to should be left to specialists.

Sir HUMPHRY ROLLESTON said that the problems raised were on much the same lines as those in connexion with oral sepsis and formed part of the wider conception of focal infections. The common affections of the throat and naso-pharynx were especially prone to lead, by a process of direct spread, to disorders of the respiratory tract—laryngitis and bronchitis; a special form of this sequence of events was seen in post-operative lung complications, which in the past were often explained as pulmonary embolism; but according to Whipple, who called the condition pneumonitis, were commonly due to pneumococcus type IV. As with the teeth, so with the infections in the naso-pharynx and adjacent parts, a distinction between discharge into the alimentary canal on the one hand and into the lymphatic or blood-stream on the other hand, seemed important; the distinction must not, however, be pressed too far, for hæmatogenous infection, especially of the gall-bladder, might occur in the abdominal viscera. Much inflammatory disturbance of the tonsils, sinuses, &c., might exist, for a time at any rate, without any obvious general or remote manifestations. As in the more acute fevers, there was an incubation period, sometimes lasting for years, during which the process of sensitisation of parts of the body apparently took place. But as a cause of the sudden outburst of general or remote manifestations in a previously latent case of such a kind, the occurrence of a secondary infection must be admitted; and further, the chronic absorption of toxic products might have sapped the patient's powers of resistance and prepared the way for the new infection. The conception of local sensitisation of tissues, for example, of the articular structures, to toxins absorbed from the tonsils and sinuses was also of interest in connexion with Rosenow's view that bacteria have very special affinities for certain tissues, for example, streptococci from the tonsils are prone to select the joints, muscles, and the gall-bladder. A female patient, who was having a streptococcic vaccine, had attacks of biliary colic which seemed to be definitely related to the vaccines; the latter were stopped on the hypothesis that they set up cholecystitis in a sensitised gall-bladder. This stoppage was followed by cessation of the biliary attacks, and for six months all seemed well, but then the biliary attacks recurred and operation revealed numerous small calculi in the gall-bladder. The vaccine might have set up cholecystic reaction and extrusion of the calculi, but these alone might as a series of coincidences have caused the colic. A difficult point concerned with secondary or mixed infections of the throat was to distinguish between those which give rise to rheumatism—namely, manifestations held in check, if not abolished, by efficient salicylate treatment—and those which, not being thus restrained, were more virulent. Probably these conditions might occur together, and then at the best only a temporary improvement followed salicylate.

Dr. JOHN POYNTON dwelt on the connexion between tonsillitis and acute rheumatism. In 1900 he and Dr. Paine had isolated a diplococcus from the mitral and aortic valves of a case of heart disease, and had by means of this organism produced experimental rheumatic lesions. He looked upon the tonsils as a first line of defence, which might, if damaged, become a source of danger, in which case they must be removed. Removal, however, could not be relied upon to prevent further attacks of any particular condition. There was difficulty in defining a healthy tonsil, although much was known concerning infection. With regard to appendicitis, he had used a micrococcus from a boy with rheumatoid arthritis to produce experimental appendicitis, from which he had recovered the organism used. He showed slides illustrative of experimental appendicitis, pointing out how the infective organisms were taken up by the lymph cells, which were there shown to be exercising a defensive function. He also referred to the frequency of acute tonsillitis in leukæmia. He believed that some day the so-called blood diseases would be recognised as examples of abnormal reactions to forms of blood infection.

Sir STCLAIR THOMSON spoke of the extent of the subject, remarking that one evening could easily be spent in discussing the remote manifestations of infections of tonsils and another to those of infections of adenoids. Nasal obstruction, catarrh, and interference with breathing and swallowing were the chief symptoms handled by the specialist, and were therefore not included in the discussion. The specialist could, however, suggest two points to assist the family physician to recognise disease of the accessory sinuses: (1) a bad smell from the nose, observed by the patient; (2) the presence of pus, whether appearing in the nasal discharge or in the post-nasal space. He uttered a warning against too active surgery in the cases under discussion; it was advisable to operate "à froid," not "à chaud." He showed several slides of charts illustrating the prolonged fever sometimes caused by the presence of pus in the nose.

Mr. W. M. MOLLISON said that there was scarcely a disease for which the surgeon was not sometimes asked to remove the tonsils; he proposed to deal

only with nephritis as a result of tonsillitis. The surgeon was usually called in after the first attack of nephritis; albuminuria and hæmaturia generally increased immediately after operation for removal of tonsils, but later they disappeared. A. A. Osman had found that at Guy's Hospital, of a series of over 60 cases of nephritis, 55 per cent. had begun with tonsillitis. He (Mr. Mollison) recalled a case of a girl, aged 26, who had had two attacks of acute nephritis following acute tonsillitis. He had removed the tonsils, and heard two or three years after from the physician in charge of the case that the patient had had no further attack of acute nephritis, and showed a very slight degree of albuminuria. In other cases he had found albuminuria persist after removal of tonsils.

Dr. E. M. CALLENDER spoke of the pitfalls of the subject from the general practitioner's point of view. He agreed that Waldeyer's ring constituted a first line of defence against infection. He could remember no child in his own practice who had had the naso-pharynx cleared and had thereafter shown more liability to disease; if anything, he sometimes thought, these children were less liable to be infected than others. The general practitioner saw the beginnings of disease, but those beginnings were sometimes very difficult to recognise; he instanced a case where he had been called to a girl who was stated to be suffering from "a touch of sun," who presented only an ordinary febrile condition, only complained of a sore throat 24 hours later, and developed a tonsillitis 24 hours later still. During the war, in both England and France, he had been struck by the numbers of men with chronic otorrhœa; the latter seemed to go on all right with free drainage, but there was no free drainage in infections of the accessory sinuses. The most frequent form of such infections was the common cold—preventable, he thought, if taken before the bacilli were buried in the inflamed mucous membrane. He divided colds into those caused by *B. catarrhalis* and those caused by the pneumococcus.

Mr. E. D. D. DAVIS named many conditions for which he had been asked to remove tonsils. The tonsils, being specialised lymphatic glands, must always be examined before other less likely causes of illness were considered. Experience had not convinced him that colds were any less frequent after tonsillar operations.

Dr. WILLIAM HILL recalled that in his student days, before the discovery of the Klebs-Löffler bacillus, he was taught that albuminuria should be searched for in acute tonsillitis, and that if albuminuria was present the case was probably diphtheria rather than acute tonsillitis. He had found in his own experience that this idea would not fit in with facts.

Mr. TILLEY briefly replied.

BRIGHTON AND SUSSEX MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on Feb. 7th, Dr. ELIOT CURWEN, the President, being in the chair.

Prof. HUGH MACLEAN read a paper on the

Present Position of Renal Disease and Albuminuria.

He considered many of the older methods for testing the efficiency of the kidneys were of very little value, and at the present date unnecessary. The urea-concentration test—which is of a simple character, not expensive, and capable of being carried out by any general practitioner in a few minutes—was the most efficient and satisfactory. Albumin in the urine he did not consider so serious a symptom as was formerly thought. A small portion of the kidney might be disorganised, permitting the transudation of albumin, whilst the remainder was in a healthy condition and capable of carrying on the full functions. Rest and warmth are the chief lines of treatment. Washing out the kidney with large draughts of water he did not consider of much use as the kidney in the diseased state was incapable of excreting the water. Great reduction of protein food was not only considered unnecessary but in some cases harmful.—A vote of thanks was proposed by Dr. E. F. MAYNARD, seconded by Dr. R. SANDERSON, and carried unanimously.

Dr. H. M. GALT showed microscopical slides of (1) injected kidney, (2) normal human kidney (stained), (3) kidney in advanced interstitial nephritis, (4) kidney showing early amyloid change.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

A MEETING of this Society was held on Feb. 1st, with Dr. A. MAITLAND RAMSAY, the President, in the chair.

Dr. A. E. MILNER gave a communication on the

Treatment of Lupus Vulgaris by the Diathermy Current.

After a brief description of the current and the form of apparatus used, Dr. Milner explained in detail the method he employed in the treatment of lupus vulgaris. The patient is placed on the condenser couch and the diathermy current turned on. The operator approximates a well-earthed electrode about the thickness of a darning needle to a distance of one-sixteenth of an inch from the part to be treated, when a succession of sparks passes from the patient to the electrode. A general anæsthetic is essential, and, of course, the danger of ether in the presence of sparks must be remembered. The area to be treated is first circumscribed by a ring of sparks, leaving about one-eighth inch of healthy tissue around it, and is then systematically cauterised over the entire surface. A dressing of calamine and bismuth cream is employed thereafter. A few cases are cured by one treatment, but usually two or three are necessary. The resulting scar is surprisingly good and scarcely noticeable. Should the scar be at all thick owing to previous treatment of the lupus with other methods, the application of X rays is effective. Dr. Milner had found that the most favourable case to treat was lupus vulgaris simplex, and emphasised the necessity of ensuring that every diseased part was accessible to the spark. He had found the results unsatisfactory in the cases where there was, in addition to the lupus, tuberculous disease of the mucous membrane of the nose, mouth, or lacrymal apparatus, as reinfection of the wound almost invariably took place.

The analysis of cases treated, excluding all cases in which the nasal or other mucous membranes were affected with lupus, was as follows: Total number of cases treated, 60; cases cured, 42; total number of operations performed on cases cured, 145; cured by one operation, 5; cured by two operations, 5; average number of operations on cases cured, 3·5; average time occupied in treatment of each case, 3·4 months. Time since cure was effected: Over 4 years, 1 case; over 3 years, 13 cases; over 2 years, 6 cases; under 2 years, 22 cases.

Dr. A. BRUCE MACLEAN described the results of the treatment of a variety of cases by

Medical Diathermy.

He had found the best results in the following types of case: (1) Fibrositis; where definite nodules can be felt. These nodes were usually rendered painless after a few applications, and often disappeared in a few weeks. (2) Neuritic pains and neuralgias; sciatica responded well to four to six treatments of about 40 minutes each. (3) Arthritis. Although little influence could be exerted on the disease, relief of pain could nearly always be obtained. (4) Circulatory disturbances; particularly those in which a

gh blood pressure was the important factor, as the athermy current had a marked influence in the duction of the blood pressure. (5) Gynæcological ases—e.g., ovarian neuralgia, dysmenorrhœa, &c.

Dr. LAWRENCE STEWART, in the absence of Dr. AMES R. RIDDELL, showed a series of cases of odent ulcer treated by the diathermy spark.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTIONS OF MEDICINE AND SURGERY.

A JOINT meeting of these sections was held in the Royal College of Physicians of Ireland on Jan. 25th. The President of the Surgical Section, Sir WILLIAM . DE COURCY WHEELER, was in the chair.

JAUNDICE.

In opening the discussion on this subject Mr.). P. D. WILKIE (Edinburgh) said that he felt joint iscussions were most useful, and he was of opinion hat close coöperation between physicians and surgeons vas essential. One form of hæmolytic jaundice was ongenital, and it was the exception rather than the ule for surgeons to be called on in such cases. Removal of the spleen in cases of hæmolytic jaundice vas being widely practised in recent years. He ersonally had performed this operation with great uccess in cases of the acquired type of hæmolytic aundice, but these cases were relatively rare. He was of opinion that the diagnosis of jaundice cases was of he greatest importance, because the different forms of treatment were decided on according to the diagnosis. If a surgeon saw a case of jaundice which had been liagnosed as obstructive jaundice, he usually thought hat it might be due to gall-stones, and at operation ie looked out for these. Causes of obstruction of the ile-ducts other than stone or malignant disease were liscussed, including pancreatitis and cicatricial con- raction following such operations as cholecystectomy. When the gall-bladder was available and the obstruc- tion to the biliary passages could not be removed, cholecystenterostomy, and particularly cholecysto- gastrostomy, gave excellent results. The operation of anastomosing the common hepatic duct to the duodenum was attended with considerable risk, particularly if the patient was very jaundiced, and the greatest risk was that of hæmorrhage. This could be diminished by decreasing the coagulation-time of the blood by means of intramuscular injections of 15 c.cm. of a 30 per cent. solution of sodium citrate into each buttock, following the method of Neuhof and Hirschfeld. These injections were painful unless preceded by a local anæsthetic such as novocaine. The method of lessening coagulation-time introduced by Lee and Vincent and advocated by Walters at the Mayo Clinic, by injecting 5 c.cm. of a 10 per cent. solution of calcium chloride three times daily for three days before operation, had not given satisfactory results in Edinburgh, and had been discarded in favour of the intramuscular injection of sodium citrate. Recently, blood transfusion had been done before operation, and if there was much bleeding after operation it was repeated. There was also the danger of hepatic insufficiency, as a result of which patients frequently did very well for the first few days after operation, but became ill about the third day and died soon afterwards in a state of coma. This could be guarded against to some extent by giving glucose by the mouth or subcutaneously, before operation: experiment had shown that life could be greatly prolonged in a dog deprived of its liver by giving glucose. Hot packs to the liver were useful in combating post-operative hepatic shock. Mr. Wilkie dealt in this connexion with the "white bile" which was found occasionally filling the bile-ducts and the gall-bladder in cases of obstructive jaundice. He described the fluid as crystal clear and approximating more closely the composition of distilled water than any other fluid found in any circumstance in the human body. When the obstruction was relieved in these cases and the patient lived, biliary secretion of normal colour and constitution reappeared within a few days. Coloured drawings were shown illustrating the effects of experimental ligations of the biliary ducts, demonstrating that "white bile" was a secretion of the ducts themselves, which sometimes, in the human subject, continued when the activity of the liver cells was in abeyance. Renal insufficiency also had to be considered.

The van den Bergh Test.

Dr. T. G. MOORHEAD said that from a physician's point of view jaundice was not a very satisfactory subject to deal with. A great deal had been learned in recent years concerning the pathology and ætiology of jaundice, but no real advance had taken place in its treatment. There was no gland in the body over which the physicians seemed to have less power, as far as remedies were concerned, than over the liver. He agreed fully with Mr. Wilkie that the most important thing for the physician to do was to arrive at an accurate diagnosis, and in this respect an advance had been made by the introduction of the van den Bergh test, but unfortunately, this test had proved less satisfactory than was at first hoped. Since the appearance of McNee's paper in the *British Medical Journal* of May, 1922, he personally, and many others, had been working with the test. It was at first hoped that it would enable the physician to distinguish between obstructive jaundice and toxic jaundice, but this hope had proved fallacious. Dr. Moorhead hoped, therefore, that further experience in or modification of the test would soon be produced. Where diagnosis was impossible he felt that an exploratory laparatomy should be performed, if conditions were not improving with the patient, after a lapse of some weeks. Even as a physician he would rather have an unnecessary laparotomy performed than fail to recommend one which might do good. He would like to add his testimony to that of Mr. Wilkie regarding the success of cholecysto-gastrostomy in suitable cases, and lastly, he would like to say that in many gall-stone cases, in which jaundice did not develop, operation was not essential.

Dr. ALFRED R. PARSONS referred to the van den Bergh test, and said that, as far as his own experience went, the test certainly demonstrated by the different reaction obtained that the type of bilirubin found in the blood in hæmolytic jaundice differed from that found in obstructive jaundice.

Practical Points in Prognosis.

The CHAIRMAN drew attention to certain practical points affecting the prognosis in cases of obstructive jaundice. He said that (1) surgeons in the past rather dreaded the possibility of post-operative oozing of blood into the general peritoneal cavity and recently papers were published indicating that probably a 58 per cent. mortality could be traced in part to slow intra-abdominal hæmorrhage. He referred to the recent work of Walters, Vincent, Lee, and others in administering calcium chloride to quicken the coagulation-time of the blood. Calcium also combined with the bile pigments in the blood-stream and so reduced toxæmia. (2) Much attention had been recently focused on the presence of white bile found in the ducts in cases of obstruction, and on the high mortality which followed any operative treatment in such cases. The term "white bile" was a misnomer; it was a colourless fluid secreted by the glands lining the ducts, and indicated hepatic insufficiency following obstruction. The patient might or might not be jaundiced, and thick, black bile was found in a non-functioning gall-bladder, the result of stasis. The bile had probably remained in the gall-bladder for a considerable time, and must not be mistaken for fresh bile passed into the gall-bladder from a functionating liver. (3) The prognosis was bad, he held, if bile did not appear soon after the establishment of drainage in cases of jaundice.

or if only a little came for a few days and then stopped. In these cases the prolonged back-pressure on the liver had probably caused such injury to the hepatic cells that there was cessation of function which, if not quickly restored, was followed by death. (4) A sudden flow of bile flooding the operative field in cases of obstruction gave anxiety. Such sudden relief of back-pressure had a similar effect on the liver as sudden relief of back-pressure had on the kidneys. The liver became engorged with blood as the result of sudden emptying of the bile-ducts, and the condition known as "liver shock" might follow a few hours after operation. In these cases surgeons endeavoured to decompress the liver gradually by keeping a clamp on the tube and allowing small quantities of bile to escape at regulated intervals.

The Chairman further referred to the reports he had made to the Academy of Medicine on the results of the Talma-Morison operation in 1904. In 1914 he reported a case referred to him by Dr. Parsons, in which tapping of the abdomen was resorted to with ever-shortening intervals until the patient became emaciated and confined to bed. At operation the liver was found fibrous, hard, and contracted to less than half the normal size. The operation did not cure the patient's weakness for indulgence in alcohol, but otherwise he remained well to this day. At the time when these early cases were reported, jaundice was considered a contra-indication to operation in cases of hepatic cirrhosis. Kocher, in his text-book, referred to the work done in Dublin in connexion with this subject, but thought that the operation, with certain precautions, would be successful even in the presence of jaundice.

The Rôle of the Spleen in Jaundice.

Considering recent work on the rôle of the spleen in cases of cirrhosis of the liver and jaundice, all were agreed on the excellent results which followed splenectomy in hæmolytic jaundice and Banti's disease; but it had not been so generally accepted that certain cases of cirrhosis of the liver responded satisfactorily to the same operation. According to Mayo, approximately one-fourth of the total blood in the portal circulation came from the spleen. A spleen over-burdened with toxic blood might deliver an unfinished product and be directly responsible for hepatic cirrhosis; and again, if cirrhosis arose independently, the hepatic cells which had a high power of regeneration might be relieved by stopping the blood flow from the spleen; the underlying principle being the same as in the Talma-Morison operation.

DR LEONARD ABRAHAMSON said that for some time it was believed that infectious jaundice was due to associated infection of the bile-ducts, but latterly it had been found that these cases were really due to septicæmia. It was probable that the mode of infection was the blood-stream, and that if blood cultures were done sufficiently often, organisms would be found in the blood-stream. If cases of catarrhal jaundice were seen early enough, and blood cultures were done in every case, he thought it would be an advance in the treatment of jaundice. In French schools they thought that there were three types of jaundice: (1) the definitely obstructive type; (2) the definitely hæmolytic type; and (3) the toxæmic type. Cases of jaundice were often seen in which there was retention of the bile-pigments, but no retention of bile-salts, or in which there was retention of the bile-salts, and not of the bile-pigments. Up to the present, there was really no good test for liver insufficiency. He would like to know if in cases which were operated on for jaundice horse serum had any value in preventing hæmorrhage. He had seen horse serum given in one case only, but in that case there had been practically no hæmorrhage. Urobilinogen was found frequently in the urine of jaundiced patients, and he believed this showed liver deficiency. Cases of heart failure in which there was definite jaundice were generally fatal, and he would like to know what the actual cause of death in such cases was.

Mr. C. J. MACAULEY said that, in his opinion, surgeons were too inclined to take over a case straight from a physician and operate at once without being confident enough of the diagnosis, and commented on the points which had been raised about renal insufficiency and hepatic insufficiency.

Dr. HENRY MOORE said that in nearly every case of jaundice in his experience bile was found in the stomach contents at some time during the three-hour period, and yet in some cases he had come across the bile did not seem to cause the patients very much inconvenience. He quite agreed with Dr. Abrahamson that there was no very reliable test for liver insufficiency. He believed a new test had recently been invented by the Americans. He did not think much information could be got by testing substances, he would rely more upon functional tests.

Sir WILLIAM TAYLOR said he thought that in a great many cases the bad effects after operation could be avoided if more care was taken in diagnosis. He did not agree with Dr. Moorhead that a patient with gall-stones should not be operated on. He would operate on every case of gall-stones, provided the patient had sufficient symptoms to justify a definite diagnosis of gall-stones.

UNIVERSITY COLLEGE, CORK, SCIENTIFIC AND MEDICAL SOCIETY.

Exhibition of Cases and Specimens.

A MEETING of the Medical Section of this Society was held on Jan. 29th, with Dr. D. MORRISSY in the chair.

Dr. J. B. HORGAN presented a case of mastoid suppuration in a male aged 30 years, which illustrated the difficulties of diagnosis of a suspected lateral sinus thrombosis. Symptoms and temperature showed no abatement some three days after a radical operation for the relief of an acute exacerbation of a chronic suppurative otitis media. Examination of cerebro-spinal fluid showed a normal fluid, the lungs were normal, and examination of the blood gave no indication beyond a relative preponderance of polymorphs in an otherwise normal white-cell count. There were no rigors or chilly feelings. The temperature still running an intermittent course, a blood culture was made in which streptococci were obtained in pure culture. The internal jugular vein was ligatured and resected, and the lateral sinus was found to contain a septic thrombus some 2 inches long. On removal of this with obliteration of the sinus and administration of antistreptococcus serum the patient made a complete if tardy recovery.

Dr. H. COTTER presented a case of separation of the upper humeral epiphysis without displacement, and with an almost negligible history of injury. A radiogram was shown in illustration of the condition which was remarkable in that symptoms of pain and a coarse crepitus were first complained of two months after injury, and were possibly due to organisation of an effusion into the joint capsule.

Dr. R. C. CUMMINS demonstrated two cured cases previously shown before treatment had been instituted. They were, respectively, kerion of the beard treated with a mercurial ointment and staphylococcic vaccine, and a lupoid syphilide of the circumoral region.

Dr. N. MARSHALL CUMMINS presented a case of congenital defect in the ventricular septum. This was remarkable in that the patient was 30 years old, had never complained of cardiac distress, and had never been ill in his life. Cyanosis, polycythæmia, left ventricular hypertrophy, and a loud systolic murmur with maximum audibility at the fourth left interspace radiating into the neck, arms, and over the chest posteriorly, were all present.

Messrs. William Heinemann (Medical Books), Ltd., announce the forthcoming appearance of "Insulin in General Practice," by Dr. A. Clarke Begg, written entirely from the clinical standpoint.

Rebiews and Notices of Books.

PSYCHO-ANALYSIS.

A Critical Examination of Psycho-Analysis. By A. WOHLGEMUTH, D.Sc. Lond. London: George Allen and Unwin. 1923. Pp. 250. 10*s.* 6*d.*

EXCEPT for the work of MacCurdy and Rivers, there has been little effective criticism of psycho-analysis, and the student will open Dr. Wohlgemuth's book with the expectation of finding help in sifting the wheat from the chaff. The author soon settles down to consider fundamental questions and asserts that to talk about psychic facts before and after the stage of "awareness" is surely nonsensical, for the essential of a psychic fact is just this awareness. But many observers have found themselves obliged to assume that mental processes take place without the subject being aware of them, and the author's dismissal of this assumption as nonsensical is a *petitio principii*, though he tells us that psycho-analysts produce not a shred of proof, only assertions. One seeks for evidence that he has followed the same methods that these observers have followed, but, unfortunately, it is not easy to tell when he is "guying" the methods and when he is producing evidence meant to be taken seriously. He attempts by introspection to discover within himself particular tendencies which Freud claims to be present in every normal man, and on failing he remarks that Freud and his followers will retort that the experiments merely prove that no such tendencies are *conscious* in him, which is precisely what the experiments do prove. Since psycho-analysts postulate that such tendencies cannot be discovered by unaided introspection, the experiments have little bearing upon the subject and are not strengthened by the addendum that "their psycho-analytic method merely discovers in the patient what the psycho-analyst has been putting there himself," which is another *petitio principii*. The clinical experience of the results of the revival of lost memories, a method which as applied to war cases led many workers to accept the theory of the unconscious, is dismissed by a comparison with Mesmer's "salutary crisis" and the statement, without references, that "some authorities have pronounced themselves against this method in no equivocal manner."

There are, as would be expected from a psychologist of Dr. Wohlgemuth's standing, many sound criticisms to be found in the book. Some of the mystical and fantastic developments of psycho-analysis provide the author with points for effective attack, and he is not slow to detect important inconsistencies between the opinions of Freud and of Ernest Jones, his well-known disciple in this country. But he sets out to prove too much. It is too late in the day to say that psycho-analysis is a confidence trick, or that psycho-analysts are moral voyeurs, and the joke about psycho-analists on pp. 205 and 224 has lost its freshness. The book may afford pleasant reading to those who like to see psycho-analysis smitten hip and thigh, but it is not a sober and dispassionate examination of Freud's teachings.

Psycho-Analysts Analysed. By P. MCBRIDE, M.D., F.R.C.P.E., F.R.S.E. With Introduction by Sir H. BRYAN DONKIN, M.D. Oxon., F.R.C.P. London: William Heinemann (Medical Books) Ltd. 1924. Pp. 142. 3*s.* 6*d.*

Dr. McBride submits psycho-analysis to such criticism as he considers it to merit and arrives at certain conclusions, the first two of which are: that the whole scheme rests upon pure hypothesis or a series of hypotheses, and that these hypotheses "are so improbable as to vitiate their use as legitimate premisses." Upon these conclusions it follows naturally that it is unjustifiable to deduce from the hypotheses a method of treatment, and that, where this has been done, no evidence of success is forthcoming. There is nothing more important for the progress of medicine than submission of medical theories to criticism, but we do not find in this short series of chapters the broad outlook or unbiassed attitude which makes such criticism helpful. With other of the conclusions to which readers are invited to assent we could agree or partly agree, or from them could differ to a greater or less extent, without finding ourselves compelled to condemn in uncompromising language the practice of psycho-analysis. Certainly this practice has been exploited by some in an unworthy manner, but we feel that the author of "Psycho-Analysts Analysed" has entirely failed to demonstrate that no good has or can ever emerge from it.

NUTRITION.

Nutrition and Clinical Dietetics. Third edition. By HERBERT S. CARTER, M.A., M.D., Assistant Clinical Professor of Medicine, Columbia University, New York; PAUL E. HOWE, M.A., Ph.D., Associate, Rockefeller Institute for Medical Research; and HOWARD H. MASON, A.B., M.D., Associate in Diseases of Children, Columbia University. Philadelphia and New York: Lea and Febiger. 1923. Pp. 731. $7.50.

THE third edition of this excellent American work on dietetics has several improvements and additions. Much has been added in the chapter on Vitamins, which has been brought thoroughly up to date, while the discussion of the feeding of children has been enlarged to include the results of the recent critical survey of the subject by Holt and Fales in the United States. Recent work in connexion with the investigation of rickets and an account of Pirquet's "nem" system of feeding have also been included. In the section on Clinical Dietetics there is an interesting discussion of the subject of the ketone-antiketone properties of foods in their relation to diabetes.

Nutrition: The Chemistry of Life. By LAFAYETTE B. MENDEL, Sterling Professor of Physiological Chemistry, Yale University; Research Associate of the Carnegie Institute of Washington, D.C. Yale University Press. London: Humphrey Milford, Oxford University Press. 1923. Pp. 150. 14*s.*

THIS charming little book, the subject-matter of which formed the Hitchcock Lectures delivered at the University of California, will be welcomed by a large number of readers. The author is one who speaks with authority on this subject, and has dealt with it in an entertaining manner. The historical matter will for the most part be new to many, and serves to show how greatly and how rapidly the subject has developed. There are five chapters, the first is a retrospect, the second deals with the importance of "little things" in nutrition, the third with the vitamins, the fourth with the protein factor in nutrition, and the last with the energy problem in nutrition. The book is logical, the story is well sustained, and the style interesting, while good illustrations are numerous. Our congratulations to the author on a really excellent book.

DISEASES OF THE EAR.

Third edition. By PHILIP D. KERRISON, M.D., Junior Aural Surgeon to the Manhattan Eye and Ear Hospital. London and Philadelphia: J. B. Lippincott Company. 1923. Pp. 614. 35*s.*

THE publication of a third edition of this book within three years of the appearance of the second edition is proof of its popularity, which is well deserved. It is a model of what a text-book should be, for it contains a careful and thorough description of examination methods, providing elementary knowledge which the student should and the practitioner must possess, and gives details about the more obscure conditions which the specialist requires. In this edition there is but little change

in the substance of the work. A new and valuable chapter has been added on tumours of the eighth cranial nerve, based chiefly on Prof. Cushing's series of cases. The recent work on the otolith apparatus by Magnus and de Kleijn is just mentioned; a short abstract, sufficient to indicate its scope, would have been welcome. On the subject of cochlear function Wrightson's theory of audition and Gray's theory of maximum stimulation now receive mention, and, under the ætiology of otosclerosis, also Gray's degeneration theory.

The book is well illustrated, and is one of the best text-books on the subject we have seen.

TUBERCULOSIS.

Pulmonary Tuberculosis: its Diagnosis and Treatment. By JOHN GUY, M.D., D.P.H. Camb., F.R.F.P. & S. Glasg., F.R.C.P. Edin. Edinburgh: Oliver and Boyd. 1923. Pp. 307. 16*s*.

THIS book is intended primarily for the student, but the author hopes it may be of some use to the practitioner wishing to refresh his knowledge. It should fulfil both purposes well, although the practitioner may, perhaps, find the chapters on treatment comparatively short. But the author is well advised in devoting so large a section of his book to diagnosis, and the various means by which the disease can be detected early. The practitioner will often find that early diagnosis and simple rest treatment will save the patient from the need for the tinkering and symptomatic treatment the advanced consumptive is usually given. It is a sign of the times that the treatments to which the author gives most prominence are sanatorium treatment and artificial pneumothorax—measures neither of which comes, as a rule, within the sphere of the practitioner. He will assuredly again come into his own when he diagnoses the disease before gross changes occur.

With regard to tuberculin, the author does not consider the case for it to be proven, and he notes that the present consensus of opinion is against it. There is nothing so important in the diagnosis and treatment of tuberculosis as the scientific use of the clinical thermometer, and it is disappointing to find the author to be vague in his references to temperatures. On p. 227, for example, he writes: "If fever be present, and the temperature reach 100° F. in the morning, this period in bed should be extended indefinitely." On the next page he writes: "In sanatorium practice it is an almost invariable rule that a patient with either a morning temperature of 99° F. or an evening one of 100° F. (rectal) should rest all the following day." Readers unfamiliar with sanatorium treatment might assume wrongly from these words that if the temperature were a few tenths below the figures given, rest in bed was not indicated. In the chapter on Difficulties of Diagnosis he is to be congratulated on his condemnation of the authority who "plumps for" a diagnosis of tuberculosis on inadequate evidence. He gets the credit for early diagnosis, but many a non-tuberculous person struggles for the rest of his life under the stigma of tuberculosis. The author's advocacy of employing all the most searching modern diagnostic methods is most timely, and in this respect, as well as in many others, his book should prove of value.

Rules for Recovery from Tuberculosis. Fourth edition. Thoroughly revised. By LAWRASON BROWN, M.D. Philadelphia and New York: Lea and Febiger. 1923. Pp. 217. $1.50.

THIS is an old friend. Several changes have been introduced, vitamins being briefly discussed, and several new suggestions being made in the chapter on foods. Throughout the book numerous minor amendments have been made in an attempt to keep it abreast of modern knowledge. But there are no revolutionary changes, and this is all to the good, for the earlier editions have been most excellent. Ostensibly, this book is for the guidance of the patient, but were every physician to study it with the attention usually reserved for larger and more pretentious works, the standard of treatment of tuberculosis would undoubtedly be raised. The author possesses the rare combination of facility of diction and the capacity to condense important information, and the reader should be careful not to skim the book, failing to note that there is some profound truth in almost every sentence.

SCIENCE AND THE FUTURE.

Dædalus. By J. B. S. HALDANE. London: Kegan Paul, Trench, Trübner and Co. 1924. Pp. 93. 2*s*. 6*d*.

"WONDERFULLY clever and I daresay mostly true," as Darwin said when he had been reading Herbert Spencer.

In this bright and witty book the Reader in Biochemistry in the University of Cambridge exercises an admirable faculty of being serious without being solemn in telling of his dreams of what scientific progress will bring. Chemistry and physics will proceed on their way; cheap power will be collected by windmills and stored as hydrogen made electrolytically from water; food will be made in factories, carbohydrates from cellulose, proteids from coal and free nitrogen; space and time will be minimised in various directions. But the future really lies with the biologist, who alone can make man what he should be—body, soul, and spirit. We are at present almost wholly ignorant of biology which makes us too modest in our estimates of what it may achieve in the future: once it can disentangle generalisations of the order of those which have lately been tumbling over one another in molecular physics we shall realise what its potentialities are. As a small example the author gives us the production of children in vitro: a good ovary will produce an egg a month under suitable conditions, and most of them can be fertilised and grown successfully in artificial solution for nine months and then brought out into the air. These ectogenetic children will restore the population depleted by the success of preventive campaigns, and the ova and spermatozoa can be so selected that the very best products can be guaranteed. So shall science ultimately achieve its aim—that man should conquer space, time, and matter, and then his body and finally the evil in his soul. "The open secret my door discloses Is fairer than God or woman or roses," as the author says elsewhere.

Mr. Haldane's essay can be heartily commended for general reading, even to those who saw its substance in the *Century Magazine* for August, 1923—a previous publication which does not seem to be mentioned in the present version.

THE ELEMENTS OF PUBLIC HEALTH ADMINISTRATION.

By G. S. LUCKETT, M.D., Director of Public Health, New Mexico; and H. F. GRAY, B.S., M.S., Chief of Division of Sanitary Engineering and Sanitation, New Mexico. Philadelphia: P. Blakiston's Son and Co. 1923. Pp. 460. $3.

THE authors explain that, in the autumn of 1919 they were called upon to help in the construction of an entirely new State health department, where no organised central health agency had previously existed. This book is in no wise intended to supplant the more comprehensive text-books, but rather to furnish a handy manual of practical suggestions for the use of the practising physicians appointed as part-time health officers in the various districts, many of whom had been necessarily out of touch with modern health agencies for years. We should imagine that the book fulfilled its original purpose admirably, and will prove of practical value to many new health officers of small communities. To British readers the book will prove of interest, as showing the difference in methods which have to be adopted in such a country as New Mexico. For example, there is no mention of hospitals for infectious disease or sanatoriums. Part I

deals with public health administrative measures. Part II. deals with a large number of preventable diseases, including many which are met with in the Southern States, but which cannot, as a rule, concern the British medical officer of health; these include Malta fever, hookworm disease, beri-beri, pellagra, Rocky mountain spotted fever, and dengue. Part III. consists of appendices on various subjects, such as a plan of county health work, instructions to public health nurses, a curriculum for midwives, a dairy score card, the technique of the Schick test, disinfection and delousing methods.

No doubt the British sanitary officer will find much of interest in this volume.

CYTOLOGY.

The Physical Basis of Life. By E. B. WILSON. New Haven: Yale University Press. 1923. With 20 figures in the text. Pp. 51. 7*s.*

THIS is the first William Thompson Sedgwick memorial lecture given in the Massachusetts Institute of Technology to commemorate that distinguished and loved biologist and hygienist. It is a survey, in general terms, and addressed to a wide biological audience, of the present state of knowledge of cell structure and its significance. Prof. Wilson is a convinced mechanist, though he is not concerned to argue the matter here: he has taken the title of a famous address of Huxley's which, as he says, put a spell on him when he was a college student, and he points out how the "protoplasm" which was then the physical basis of life has since been dissected with the discovery of a great variety of organs, first mostly in the nucleus, in more recent times in the cytoplasm too. He might as well have called his lecture "The Cell in Development and Inheritance"—a book which has enthralled many an undergraduate, and which has unfolded in such a wonderful way of late at the hands of his colleagues at Columbia. We are glad to see that a new edition—about 20 years overdue—is in preparation.

SURGICAL "DON'TS" (AND "DO'S").

By C. HAMILTON WHITEFORD, M.R.C.S., L.R.C.P., Hon. Surgeon to the Plymouth Infirmary. London: Harrison and Sons, Ltd. 1923. Pp. 46. 3*s.*

THE sprightliness of the title of this booklet does not get lost in any of the ten short chapters it contains. They have been published elsewhere from time to time during the past 13 years, the first being a paper read in 1910, the last being written in 1923. Many of the "Don'ts" are useful, isolated scraps of advice, but there are a few "Don'ts" which recur throughout the booklet with certain variations, and which give a clue to what are the author's pet aversions. "Don't overrate the importance of manual dexterity." Further on he urges his readers not to confuse the operator with the surgeon. The operator's "sole asset" is his manual dexterity; he is happy only when operating, and is a distinct danger to the public. The surgeon, on the other hand, knows when not to operate. "The war has produced a copious crop of operators, but has not correspondingly increased the supply of surgeons." Some of the "Don'ts" verge on the superfluous and are hardly polite. "Don't have anything to do with secret commissions," is a warning which, like Do not commit adultery, might be taken for granted. There is one curious "Don't." It runs: "Don't accept the position of honorary surgeon to a doctor and his family, when you are never asked to attend to the surgical needs of his patients. Actions speak louder than words, and the implication, obvious and illogical, is that you are considered capable of undertaking gratuitous attendance on the doctor and his family, but incapable of treating his paying patients." The ethics of this advice are rather doubtful, but perhaps the author could a tale unfold to justify this. Most of the advice given is sound and some is witty, and the recently qualified medical student will find here much knowledge as well as mirth.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

VII.—ACTIONS FOR DAMAGES: ERRORS OF TREATMENT.

BY HUGH WOODS, M.D., D.P.H.,
GENERAL SECRETARY, LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.

. . . . being in,
Bear't, that the opposèd may beware of thee.
—*Hamlet.* Act I. Sc. 3.

WHEN every proper precaution has been taken against the risk of claims for damages founded on alleged wrong diagnosis, there still remain the risks that arise out of accusations of wrong treatment. The same condition or ailment is by no means always treated in the same way by different practitioners. Modes of treatment apparently quite different may be equally good, or opinion may be equally divided as to which is the best, or the mode of treatment approved by a distinct minority, or even by a single individual, may in fact be the best. Nevertheless, a judge and jury, who know little or nothing about it, are apt to regard any departure from the recognised routine treatment as being due to careless neglect to observe the ordinary rules of medical practice, and if a number of medical witnesses all admit that the treatment was not that which they would themselves have adopted, it may be unhesitatingly condemned even though quite suitable and quite carefully and deliberately adopted.

Safeguard of Consultation.

When a case presents special difficulties, or appears likely to have an unfavourable result, it is a great safeguard to call another doctor into consultation, and preferably one of high standing in the profession, or a specialist in cases of the kind. Here again the question of expense may have to be considered, and if it is objected to, the medical attendant will be well advised to provide himself with clear evidence that he had advised the calling in of a consultant, and that the responsibility for its not being done rests with the patient or the responsible relatives. Where medical assistance is desirable it should be asked for. If an operation is undertaken single-handed, and some mishap occurs which might conceivably have been avoided if another doctor had been present, the operator may be regarded as guilty of negligence in not insisting on medical assistance before undertaking the operation.

The Giving of Anæsthetics.

It is seldom right to attempt to operate and anæsthetise at the same time. In midwifery cases it is not uncommon for a doctor to administer an anæsthetic and to instruct a nurse to continue the administration while he uses the forceps or performs some obstetric operation, and it is sometimes not easy or perhaps practicable to do otherwise; but if any mishap occurs the doctor will run the risk of being mulcted in damages unless he can prove that there would have been greater danger in waiting until medical assistance had been procured. When there is no need for haste, and the operation can be safely and properly deferred till a qualified anæsthetist can be obtained, it is not advisable to undertake the dual responsibility.

Operation in Presence of a Third Person.

Again, it is seldom wise to perform even the more trivial operations without some responsible person being present. The experience of a patient fainting, or collapsing seriously under an operation, with imminent danger of sudden death when no one else

is present, will make a doctor very reluctant to place himself in a similar position a second time. It is desirable to have notes of cases dealt with, but in a busy general practice it is exceptional for any record to be kept of anything beyond the visits and consultations and the medicines prescribed. Prescriptions should always be recorded, especially when any poisonous drug is prescribed, whether the doctor dispenses his own medicines or not.

Delayed Complaints.

It quite often happens that no complaint of any kind is made of the treatment of a patient until, perhaps after the lapse of a year or two, the patient is informed that steps will be taken to enforce payment of the fees which remain unpaid notwithstanding the frequent rendering of the account. Then grave charges of negligence or wrong treatment are launched and payment is refused with a threat of action for damages. The doctor tries to recollect the case, and searches for any record of it, but the whole final result often amounts to a strong personal conviction that there is no foundation for the accusations, and to nothing more. Under such circumstances it needs not a little courage to go into court, and the unscrupulous patient, quite appreciating the situation, knows that he has a very good chance of escaping payment although he has no grounds whatever for his complaints. If the doctor does not sue for his fees it may encourage his patient to venture on a speculative action for damages, or he may content himself with boasting that he accused the doctor of negligence and refused to pay him and that the doctor was afraid to go into court.

Exaggerated Importance of Many Claims for Damages.

Threats of actions for damages against doctors are very common, and although they should be taken seriously they ought not to be feared in the great majority of cases. The object of such threats is usually to avoid payment of fees, and sometimes it is a comparatively safe method of attempting to blackmail. A firm attitude is essential, and great care should be taken not to spoil a good case by hasty replies inspired by indignation or alarm. Many doctors have an exaggerated idea of the harm that may be done to their practices by actions for damages. In many cases, even when damages are awarded against them, the advertising influence of a case of public interest and the sympathy aroused among their friends and neighbours may more than counterbalance any ill-effects, if the evidence does not disclose clearly reprehensible conduct, or make them appear incompetent, ridiculous, or contemptible. What makes actions for damages pecuniarily unsatisfactory is the fact that in most of the cases the plaintiff, when he loses his case, does not pay the defendant's costs, and consequently a successfully defended action involves heavy loss to the doctor, although, of course, such loss is lighter than if he had lost the case. The anticipation of such a result is not unlikely to weigh too heavily with a medical practitioner of scanty means if he has to defend himself, and it may lead him to yield to unjust demands to the encouragement of dishonest persons who seek to prey on medical men. In modern times it is to be feared that the law courts occasionally afford an effective means of dishonestly extorting money, because it is often cheaper to buy off a plaintiff than to defend an action successfully and pay the heavy costs of a barren victory.

Claims Suitable for Reasonable Settlement.

There are claims for damages which should be honestly admitted, but not in such a way as to enable an unscrupulous person to use the admission for what is morally, though not legally, blackmailing. The human machine is not so perfect that it does not occasionally fail to avoid accidents which might be avoided, and although there may be no moral culpability, yet it seems only fair that the person whose failure has caused the accident should bear the consequences, as far as is reasonable, rather than the person who is undoubtedly quite blameless. In such cases it is both honourable and prudent to settle a claim on reasonable terms, which should include on the part of the claimant an admission that there was nothing in the mishap for which liability is accepted which is discreditable to the doctor professionally. Care should also be taken that no loophole is left for subsequent claims on various pretexts which might be put forward after denial of legal liability had been rendered impracticable. When extortionate demands are persisted in they should be resisted if possible. In some cases, even when it is doubtful if there is any legal liability, but where the claim is a genuine one and the patient has in fact suffered damage, it may be advisable generously to give a "solatium" if it is accepted in a proper spirit and as a gratuitous donation, all legal claims being effectively withdrawn.

INSTITUTIONAL MEDICAL OFFICERS AND INCOME-TAX ASSESSMENT.

THE letter of the General Secretary of the Medical Defence Union, which appeared in our issue of Feb. 9th, proves the necessity of carefully scrutinising tax demands, a course recently emphasised in this column. The decision of the Special Commissioners that a medical superintendent, occupying premises by virtue of his office, is not liable to tax on the value thereof is simply an application of an established principle. In income-tax law a profit which is not cash, or capable of translation into cash, is not assessable upon the recipient, and the case of Tennant *v.* Smith (1892) is regarded as the leading decision on the point. In that case a banking company assigned to their agent as a residence a portion of their bank premises in respect of which they were assessed under Schedule "A." The agent was required to reside in the building as the servant of the bank, and for the purpose of the performance of his duties. It was then held that the value of the residence was not an emolument of office in respect of which the agent was chargeable with income-tax; and was not to be included in estimating the total amount of the agent's income for the purposes of a claim of abatement. Lord Watson said: "I do not think it comes within the category of profits, because that word, in its ordinary acceptation, appears to me to denote something acquired, and which the acquirer becomes possessed of to his advantage—in other words, money—or that which can be turned to pecuniary account." The Lord Chancellor said: "I do not deny that, if substantial things of money value were capable of being turned into money, they might for that purpose represent money's worth, and be therefore taxable . . . The thing sought to be taxed is not income unless it can be turned into money." The value of the house in such circumstances, therefore, is neither assessable on the employee nor should it be included in his return of total income. Neither is the value of board and/or lodging assessable, and it should be similarly excluded.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH: *Parkin Prize.*—In terms of the bequest made to the College by the late Dr. John Parkin, Fellow of the College, a prize is offered for the best essay on certain subjects connected with medicine. The subject of the essay for the present period is on the Effects of Volcanic Action in the Production of Epidemic Diseases in the Animal and in the Vegetable Creation, and in the Production of Hurricanes and Abnormal Atmospherical Vicissitudes. The prize is of the value of £100, and is open to competitors of all nations. Essays intended for competition, which must be written in the English language, to be received by the Secretary not later than Dec. 31st, 1924. Each essay must bear a motto, and be accompanied by a sealed envelope bearing the same motto outside, and the author's name inside. The successful candidate must publish his essay at his own expense, and present a printed copy of it to the College within the space of three months after the adjudication of the prize.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 16, 1924.

INFLUENZA.

DEATHS from influenza in the 105 great towns increased from 236 to 367, and in London from 74 to 122, in the last week (ended Feb. 2nd) for which figures are available. The distribution of these deaths showed somewhat increased incidence upon the ages 45–65 as compared with the age-group 65 and upwards, but no increased proportion of deaths below 45—that is to say, no reversion to the 1918 epidemic type. The rate of increase slackened from 64 per cent., which was the increase in the week ending Jan. 19th over the previous week, to 54 per cent. Provisional figures for the week ending Feb. 9th suggest that although the absolute maximum of the epidemic has not yet been reached, the rate of increase appears to be slackening. The mortality in any one week, even in the most unfavourable conditions, will hardly be as severe as that of 1922. The greatest stress of mortality has so far fallen on London and certain coastal regions, particularly in the north-east. Thus, in South Shields deaths from influenza in the successive weeks have been 4, 14, and 24; in Newcastle-on-Tyne 1, 9, and 16. Clinical reports are consistent with the impressions derived from the mortality figures. Widespread epidemic influenza of a mild 3–4 day type has prevailed in Durham and Northumberland. An area including Bath, Gloucester, Weston-super-Mare, and Trowbridge has been widely affected by mild influenza, and there is some evidence of extension to the South Wales coalfield. In the north-west cases have been relatively few. There is complete concordance of opinion that severe and pneumonic complications are very rare. In Paris influenza is unusually prevalent, it is increasing in Switzerland, declining in Algeria and Mauritius. This is the position as it is seen by the medical officers of the Ministry of Health.

Every such recurrent wave of epidemic influenza raises the question of the relationship of these minor epidemics to each other, to sporadic cases, and to the great pandemics such as that of 1918–19. Up to the present the lack of any constant bacteriological findings has rendered it difficult to arrive at a conclusion as to these relationships, and almost impossible to decide whether the protean conditions—gastric, nervous, cardiac, pharyngeal, and pulmonary—grouped under the common head of "influenza" are really manifestations of the activity of the same pathogenic agent. Whether a patient suffers from a "cold in the nose" or from "influenza" is largely a matter of individual taste or temperament, and so many chronic and subacute disorders have according to the histories given by the patients started in an attack of "influenza" that a condition, real enough as an entity and vastly potent as an initiator of morbid processes, is perhaps now hardly receiving its due meed of attention as an ætiological factor. Some hope of escape from this chaos was offered by the investigations of Drs. P. K. OLITSKY and F. L. GATES, reviewed in our columns [1] a couple of years ago, and more recent work of these authors [2] holds out some prospect that in the future "influenza," from being the limbo of all undiagnosed acute conditions, may come to be an entity as sharply defined and as readily diagnosable as typhoid fever. This happy consummation, of course, depends on whether or not the work of Drs. OLITSKY and GATES is capable of being reproduced in the hands of other investigators. Time alone will show this; already some evidence apparently in support is to hand from Japan.[3] The position at the moment is that from the naso-pharyngeal washings of patients suffering from influenza in the 1918–19 pandemic the American workers were able to cultivate a minute Gram-negative anaerobic organism, growing freely on artificial media, capable of passing earthenware filters and named by them *B. pneumosintes*. By injecting this organism intra-tracheally into rabbits they were able to produce a condition not dissimilar from epidemic influenza and clinically manifesting itself by conjunctivitis, fever, and malaise; the blood showed a leucopenia. The uncomplicated condition was not fatal, recovery taking place in from three to six days. If killed during the course of the disturbance the lungs of the infected animals were found to show constant and characteristic changes, consisting of œdema, emphysema, hæmorrhage, and a slight degree of cellular infiltration. The intra-tracheal introduction of pathogenic organisms such as streptococci or Pfeiffer's bacillus while the lungs were in this condition rapidly led to the development of a fatal pneumonia of the "influenzal" type.

The occurrence of a small wave of epidemic influenza in New York some months ago offered an opportunity for ascertaining whether the *B. pneumosintes* was concerned in this in the same way as in the 1918–19 pandemic, during which it was first isolated. In the course of their previous work Drs. OLITSKY and GATES had been able to demonstrate that on injection of the organism into the blood-stream of rabbits agglutinins were developed; they further showed that similar agglutinins appeared in the blood of human beings inoculated with suspensions of the dead organism. In their recent investigations they were able to demonstrate the presence of agglutinins active against the 1918–19 strain of *B. pneumosintes* in the blood of all the patients examined. These agglutinins appeared as early as ten days from the onset of the disease, and seemed to reach a maximum by about the seventeenth day; they persisted for some months—at least five—but not indefinitely, as was shown by the fact that the blood of persons who had suffered in the 1918–19 or 1919–20 epidemic, but not since, was free from them. The agglutination titre was low; even with special buffering of the antigen it seldom went beyond 1 in 40 in injected animals and in the human cases a positive result at a dilution of 1 in 10 was taken as diagnostic. Antibodies were also demonstrable by a precipitin test. Granted that *B. pneumosintes* is confirmed as the ætiological factor in the influenzal entity—a matter concerning which Drs. OLITSKY and GATES make no dogmatic assertions—these agglutinin and precipitin reactions may prove of great value.

[1] The Ætiology of Influenza, THE LANCET, 1922, ii., 187.

[2] Olitsky, P. K., and Gates, F. L.: Experimental Studies of the Naso-pharyngeal Secretions from Influenza Patients. XI. Antibodies in the Blood after Recovery from Epidemic Influenza. Studies from the Rockefeller Institute for Medical Research. Reprints, 1923, xlvi., 157.

[3] Abe, T., Ishikawa, T., Nishibe, M., Nakata, I., and Tenjin, S.: An Experimental Study of Filtering Property of Influenza Virus upon certain Animals. Scientific Report, Govt. Inst. Infect. Dis., Tokyo, 1922, i., 29.

CREMATION AND THE CONCEALMENT OF CRIME.

IN a lecture on the Disposal of the Dead, with Special Reference to Cremation, recently delivered before the Royal Institute of Public Health, Dr. H. T. HERRING, who is the medical referee to the Golders Green and Woking Crematoria, dealt with various objections to the practice of cremation. While this now well-established practice has not yet entirely disarmed popular antagonisms which in part are based upon genuine religious feeling and in part upon ancient prejudices, its advocates are aware that they have to reckon with one substantial objection—namely, the fact that incineration of the body obliterates all traces of crime. Against this objection it may fairly be argued that the present system of the law of death certification, which we hope soon to see amended,[1] is so lax that a murderer is but little inconvenienced in obtaining the burial of his victim under the existing facilities. In all murder cases the criminal is anxious not only to conceal his own part in the death, but also to conceal the facts of death itself. Where this is the position, questions of the relative advantages of graveyard and crematorium are immaterial. In other cases—for example, in the series of murders by arsenical poisoning in recent years—it looks as though the criminal was sufficiently deterred from taking advantage of the method of cremation by the very stringent precautions which the State enjoins and the very searching interrogatories which the adoption of that method entails.

The Cremation Act of 1902, passed nearly 20 years after Mr. Justice STEPHEN had decided that cremation was not illegal, authorised the Home Secretary (or in Scotland the Secretary for Scotland) to make regulations as to the construction and inspection of crematoria and as to the conditions in which the burning of human remains may take place. The Home Office Regulations of 1903 prohibited cremation except in a crematorium of the opening of which official notice had been given. They forbade the burning of unidentified human remains or of the body of anyone who has left a written direction to the contrary. The necessary forms and certificates to be filled up are most elaborate. Apart from the simpler procedure where a coroner gives a certificate following the verdict of a coroner's jury, the requisite action is as follows. A form of application is filled up by the executor or nearest surviving relative; if anyone else is the applicant he has to give a satisfactory explanation of the reason why the executor or next-of-kin has not applied. Two medical certificates are required, one from the doctor who attended the deceased during his last illness and can definitely certify the cause of death, the other a confirmatory certificate by a specially qualified medical practitioner. Both the application (which has to be supported by a statutory declaration) and the former of the two certificates must give a specific answer to the question whether there is any reason to suspect that death was directly or indirectly due to violence, poison, privation, or neglect. The application and the two certificates are quasi-judicially examined by a specially qualified medical referee who can refer them back for further information. The medical referee is forbidden to allow cremation unless satisfied that the fact and cause of death are satisfactorily ascertained; if it appears that death might have been due to violence, an illegal operation, privation, or neglect, he must require a post-mortem examination; if the post mortem fails to reveal the cause of death there must be an inquest. Finally the medical referee may refuse cremation without stating any reason. These Regulations of 1903 have been recalled in some detail to show their reassuring character. In 1920 they were revised and re-issued, but only three modifications were found necessary. One of these alterations empowered the Home Secretary to relax the procedure in certain cases of death outside England and on certain conditions. Another allowed the Home Secretary to dispense with an inquest in certain cases. A third exacted more information from the medical attendant of the deceased. In addition to stating the primary and secondary causes of death as formerly, he is now obliged to say whether any other cause, and if so what, contributed to or accelerated death; his certificate also now includes a declaration in the widest terms that there is no circumstance of any sort known to him which makes cremation undesirable.

If anyone, reading the Home Office Regulations and the wording of the forms and certificates, thinks them insufficient for the purpose, he will still find it hard to imagine how they could be made more comprehensive. The burden of investigation is properly laid upon the medical profession; it has not been suggested that there has been failure to discharge the responsibility. The ingenuity of criminals and the fallibility of human beings make it impossible to claim that the machinery eliminates all risk that cremation will allow crime to go undetected. But, short of repealing the Cremation Act and making cremation entirely illegal, it is difficult to devise safeguards more satisfactory than those which at present exist.

[1] See the summary of the proposed Bill in THE LANCET of Jan. 12th p. 92.

PHYSIOLOGICAL EFFECTS OF RADIUM AND X RAYS.

THE scanty literature of this subject has been enriched lately in a paper by Dr. J. C. MOTTRAM and Dr. W. CRAMER in the *Quarterly Journal of Experimental Physiology* (Vol. XIII., Nos. 3 and 4), and by a series of articles in Vol. VII. of the Collected Reprints from the George Williams Hooper Foundation for Medical Research, by Mr. S. L. WARREN, Dr. G. K. WHIPPLE, and Dr. I. MCQUARRIE of California University. The first paper deals with the effects of exposing rats to the beta and gamma rays of radium, the special points under investigation being the effect upon metabolism and tumour growth and some special action upon the testis and pituitary. When rats were given comparatively small doses of radiation, repeated over 40 days, they became fatter and grew inoculated sarcoma less than controls; this is confirmatory of the general findings of RUSS, CHAMBERS, and SCOTT in the case of rats and of SUGUIRA and FAILLA in the case of mice, but the present authors observed the very significant facts that in the irradiated rats there was atrophy of the seminiferous tubules with increase of the interstitial cells, as well as abnormal appearances in the pituitary gland. On irradiating the testis only, the rest of the animal being protected, atrophy of the testis occurred, yet the weight of the animal increased, this increase being attributed by the authors to the formation of fat. On giving a relatively large dose of radiation to the head of the animal only, no variation from the normal was found, and the conclusion seems justified that the pituitary changes previously observed were secondary. A large part of the paper is devoted to the histological appearances of the various organs in question under various experimental conditions. A significant finding was that atrophy of the testis brought about by irradiation is accompanied with hypertrophy of the interstitial tissue. Dr. MOTTRAM and Dr. CRAMER endeavour to correlate the inter-

relationship between testis and pituitary; in particular they refer to the conclusion of other writers that the change in the anterior lobe of the pituitary following castration is due to the withdrawal of an internal secretion attributed to the interstitial cells of the testis. They point out that this cannot be the case as the effect in question sets in after irradiation, when the interstitial cells are present or even increased. They conclude therefore that the pituitary change must be due to absence of seminal epithelium. Their observations show that the two component tissues of the testis, the spermatogenic and the interstitial, have distinct and independent effects upon the organism, that of the interstitial cells being the more profound. Even in the absence of spermatogenic tissue they provide an internal secretion which produces changes in the intermediate and nervous portions of the pituitary. Possibly other endocrine organs are affected also and contribute to the metabolic changes noted. In an appendix Dr. CRAMER describes cells in the pituitary of the rat which do not appear to have been noticed before; he calls them lipo-neurocytes. The authors have not found them in the cat, dog, rabbit or guinea-pig.

The American studies are on X ray intoxication and have a practical bearing upon the treatment by means of penetrating rays, especially where irradiation involves exposure of the abdomen. Similar doses of X rays over thorax and over abdomen produce very different effects in dogs. A dose which, directed over the thorax, gives no clinical evidence of intoxication ensures the death of the animal on the fourth day if given over the abdomen. Histological examination showed that the epithelium of the small intestine from the pylorus to the ileocæcal valve is highly sensitive to X rays. The authors attribute the intoxicating effects which follow deep irradiation to necrosis of this epithelium. The second article compares the rates of autolysis in many of the tissues of the dog under normal conditions and after doses of radiation. In general an increased rate of autolysis was found in irradiated organs, a point of special interest being that in dogs the secretory crypt of epithelium of the small intestine autolyses first and the epithelium of the villi last, the reverse being true under normal conditions. Finally a study of renal function after X ray exposures is of a reassuring character, for the authors find that the epithelium of the kidney is much more resistant to X rays than is the epithelium of the small intestine. "Our experiments give no support," the authors categorically state, "to the current belief that an X ray nephritis may be produced by direct or indirect action of the hard Rontgen rays." Large doses were given directly over the kidney, and although a slight lowering of renal function lasting a few days was noticed, no histological changes could be discovered in the kidney itself.

THE PROTECTION OF YOUTH.

THE first Bill[1] of the new Government has been ordered by the House of Commons to be printed, and has for its general object the consolidation, extension, and amendment of the Children Acts 1908 to 1921; it is presented by Mr. C. G. AMMON, Parliamentary Secretary to the Admiralty. The Bill contains enactments relating to offences against the person where the age of the subject is under 16, makes provision among other things to extend and amend the law of homicide in connexion with childbirth, and goes with particularity into the subject of infant life protection. Many new offences are created by the proposed enactments, but one of the final clauses provides that notwithstanding anything in the measure, no persons of or over the age of 16 years and under the age of 19 years shall be liable to be kept in penal servitude: the greater rigours are kept rightly for the older offenders. The first part of the Bill, which is to have force also in Scotland, extends the law of homicide to the protection of every child partly issued from the womb of its mother, while the criminal causation of the death of an unborn child will amount to felony punishable with penal servitude, or by imprisonment with or without hard labour. Enactments in the Criminal Law Amendment Acts of 1885 and 1922, with respect to sexual offences against young girls, are re-enacted with amendments and fresh provisions, while boys under 16 are also protected from the lascivious actions of women and girls over the age of 18 years. The purpose of these provisions is obvious and admirable, but medical men will see that, where their evidence is required, it may often be difficult to speak with certainty, while it is undoubted that the public will undergo added risks of blackmail, a crime now dangerously prevalent. For these reasons certain of the proposals will undergo criticism when the measure is debated in Parliament, but the evils against which the law is being directed are of so gross a nature, and have for so long been demanding abolition, that we hope to see the remedies proposed arrive in substance, even if with modification.

The number of children who will require care and maintenance, when separated from parents or guardians who have shown themselves unworthy, will be increased by the new legislation, and the second part of the Bill, in detailing the measures to be taken for infant life protection, places great responsibility upon the Minister of Health. All persons undertaking, in return for payment or reward, direct or indirect, the care and maintenance of orphans or infants who have been separated from their parents, have to make their position good to the local authority, that is to the county or borough council, and their selection will have to be justified to the Minister of Health. To be certain that adequate shelter and succour will be afforded to the children the local authority must appoint persons of either sex to be infant protection visitors, with the duties of keeping watch from time to time over the infant charges and the premises on which they are kept; while philanthropic societies, performing similar duties in respect of the infants, will be obliged to furnish reports of their procedure to the local authority. Great liberty of action is given to the local authority with regard to appointing these visitors, either as individuals or as a committee, and there is no reason to suppose that every care will not be taken; but it is obvious that the necessity for medical advice, both in choosing the visitors and defining their activities, will often be valuable. No visitor will be useful who is not kind, but it is necessary that the visitors should also be wise and tactful, for it is proposed to give them considerable discretion in discharging their duties. It will be necessary for the local medical practitioners to be familiar with the visiting machinery. In the routine of their professional duties they will be in charge of any case of sickness that may arise; by communication with the medical officers of the local authorities they can get into touch both with those who are responsible for the selection of the visitors, and with the Minister of Health to whom this selection has to be justified. For these reasons the appointment of a visiting committee rather than the selection of individual visitors appears to us quite important: for in a committee some can supply the tact and some the discretion, while all, it may be hoped, will furnish the kindness. The proceedings of such a committee could be made known in a regular way to the medical men of the district, when help could be obtained in many directions, the medical officers of health coöperating with the practitioners to supply it. We are taking it for granted that, either individually or through such committees, full use will be made of much excellent service now proceeding directly or indirectly along the indicated lines.

[1] Children, Young Persons, &c., Bill, 1924. H.M. Stationery Office. 6s.

Annotations.

"Ne quid nimis."

THE PRICE OF INSULIN.

THE story of insulin has made one of the brightest chapters in modern therapeutics, clouded only by the fact that it has not been possible to distribute the boon which medicine has provided equitably as between the rich and the poor. At first the limitation of the available supply made it impossible for any but a well-to-do diabetic subject to use the remedy for "a carbohydrate jag" (the phrase has been used in scientific circles), and the lesson has since been taught that even the most lavish use of the preparation cannot dispense with the restriction of diet and the temperate habit of life which must be observed by all diabetic subjects. After a period of general disappointment, during which people of moderate means were unable to obtain the remedy in the necessary quantities for themselves or their dependents, there have followed the happier events of far larger production, lowered prices, and in certain circumstances gratuitous supply. The Province of Ontario, for example, is providing its diabetics with free insulin on the certificate of their medical advisers.

We print this week a preliminary communication from the Bio-Chemistry Department of the Middlesex Hospital, which opens the possiblity for a *substantial* reduction in the price of insulin. This will occur if the process of manufacture can be quickened, and if alcohol can be dispensed with in the preparation of the remedy. The change may then be dramatic, and to medical men it will be a pleasing reflection, if the work proves successful, that it has been carried out at a scientific department of one of our voluntary hospitals, with the collaboration of the Medical Research Council, and has been placed immediately and without reserve at the disposal of the community. It is one more example, if example were needed, of the essential soundness of the voluntary hospital principle, for the voluntary hospital is here seen to be coming to the aid of that class which lies between the persons who are fit objects of medical charity and those to whom the price which they pay for medical service is of little matter.

"SOME ENCOURAGEMENTS IN THE SURGERY OF MALIGNANT DISEASE."

ALL surgeons of experience have had occasional unexpected successes in the surgery of malignant disease but these have been overshadowed, perhaps too much, by the number of failures; for failures so often occur in those very cases in which the prognosis has appeared most hopeful. It was, therefore, a happy thought of Mr. G. Grey Turner to give an address last week to the Section of Surgery of the Royal Society of Medicine on the subject of encouragement. In this address Mr. Turner described a large number of cases of proven malignant disease operated upon with such success that they were alive and well five, ten, or more years later, or died after a considerable interval of apparently perfect health from some other malady. While many of these cases were examples of carcinoma of the colon, a form of comparatively low malignancy, where the anatomical conditions often lend themselves to an "ideal cancer operation," there were examples of success in other and more malignant tumours and even after metastasis had occurred. In the discussion that followed, other surgeons were able to recall some very striking cures of malignant disease by surgery, perhaps the most arresting being that told by Mr. James Berry of a case of periosteal sarcoma of the bones of the forearm, alive and well 33 years after amputation through the arm by Sir T. Smith. Mr. J. E. Adams knew of a case of sarcoma of the intestine first operated upon in 1912; further operation two years later revealed extensive secondary dissemination in the peritoneum, yet the patient was now alive and well, had married, and was at present an expectant mother. The question of "spontaneous cure" was raised by Mr. H. W. Carson in whose practice such an event had occurred. From Mr. Turner's address and the discussion two facts emerge. First, that a bold surgeon may by heroic measures occasionally save an apparently hopeless case of malignant disease; and secondly, that local recurrence or even metastasis after a primary operation is not an absolute bar to the successful issue of a further operation. While the statistics of the surgery of malignant disease remain as depressing as they are, these two facts should be kept in view before a hopeless prognosis is delivered.

THE ULTIMATE RESULTS OF TREATMENT BY ARTIFICIAL PNEUMOTHORAX.

BURIED in a gigantic work,[1] to which many authors have contributed, is an article by Prof. U. Carpi on the ultimate results of treatment by artificial pneumothorax. His paper is opportune, for the critics of this treatment have lately shifted their ground, admitting that the immediate results may be excellent, but arguing that it is only palliative and incapable of achieving permanent arrest of the disease. In addition to reviewing his own results after a fairly long observation period, Prof. Carpi has collected the statistics of Dumarest and Murard, L. v. Muralt, Saugman, Tiderström and Esther Carling. Prof. Carpi's own cases number 129, of which 120 were cases of pulmonary tuberculosis. In 28 cases pleural adhesions prevented the collapse of the affected lung, and within a year 20 of these 28 cases had terminated fatally. These 28 cases he uses as controls—the standard by which he judges the efficacy of artificial pneumothorax treatment in the 92 patients in whom a pneumothorax could be induced. Only 38 of these patients died during the first year of observation. In 33 cases definite recovery was effected, and in 20 complete restoration of fitness for work could be claimed. In other words, more than 21 per cent. of the patients thus treated were enabled to take up their work as before, whereas only three of the 28 controls could do so. In many cases the recovery effected by an artificial pneumothorax had been maintained for seven to ten years, and it was evident that this recovery was anatomical as well as clinical—i.e., that the condition of the lungs was like that found post mortem in cases of healing of tuberculous lesions by fibrosis. Prof. Carpi reproduces numerous illustrations showing the changes which the collapsed lung undergoes, but in the end he admits that the mode of action of a pneumothorax is not that simple process which some would have us believe. The fact that laryngeal disease and even renal disease may clear up after a pneumothorax has been induced suggests that the process is not a strictly local one, but one with far-reaching changes in the specific defensive mechanism of the body as a whole.

NATIONAL HEALTH COMMITTEES.

IN a refreshing address[2] to the London Centre of the National Association of Trade Union Approved Societies, Mr. C. A. Clark, clerk to the West Ham Insurance Committee, spoke of the long-forgotten function of national insurance committees in the sphere of public health. It was laid down in the original 1911 Act that, in addition to their other powers and duties, insurance committees should make such reports on the health of insured persons within the area as the Insurance Commissioners might prescribe. Few insurance committees have taken up the production and publication of health reports, partly owing

[1] Handbuch der gesamten Tuberkulose-therapie. Edited by Prof. Ernst Loewenstein. Vol. II. Vienna: Urban and Schwarzenberg. 1923. Pp. 1045–2025. Swiss Fr.33.75.

[2] National Insurance Gazette, Jan. 12th, 1924, p. 20.

to the absence of trustworthy ready-to-hand data and partly from fear of trenching on the ground of the public health authority. But Mr. Clark points out with justice that these committees have already much material at hand relating to health causes and effects, some of which might throw light on housing and other health problems, and he exhorts the committees to take their share in the strenuous and continuous effort which will be necessary if present housing conditions are to be ameliorated. He would like the committees to disseminate information on the few simple health rules of real value to the community. Here again the statutory obligation of insurance committees to "make provision for the giving of lectures and the publication of information on questions relating to health" has been almost completely overlooked. Expenditure by these committees upon lectures has been restricted since 1918 on account of the diversion of the general purposes fund, but interest on bank balances is still available for this laudable purpose. Mr. Clark would concentrate on the health instruction of elementary school-children, and on enlightening parents in regard to the preventable miseries of their own past school life. Generally speaking, he would promulgate health in the following forms: (1) lantern lectures at schools; (2) at cinemas, theatres, or halls; (3) unillustrated lectures at schools; (4) competitive essays by scholars in connexion with either of the above; (5) the health game or crusade in schools; (6) distribution of literature and competitive essays thereon. At a time when the efficiency of all branches of the insurance medical service is being closely scrutinised, it would not be amiss for the insurance committees, which were once actually known as national *health* committees, to see whether some onus does not rest upon them in publishing the elements of health in accordance with the information which is in their hands, and to some extent in their hands alone.

ACUTE SYPHILITIC TRANSVERSE MYELITIS.

Dr. H. N. Cole,[1] of the Department of Dermatology and Syphilology of the Medical Department of the Western Reserve University, and of the Cleveland City Hospital, who reports two illustrative cases, remarks that acute syphilitic transverse myelitis is actually not very uncommon. Of 1085 cases of syphilitic disease of the nervous system, mainly among Fournier's patients, Boulloche found 77 with a spinal onset. Williamson, in 1899, stated that between 1880 and 1899 118 cases of tabes occurred at the Manchester Royal Infirmary, as compared with 32 cases of spinal syphilis, six of which were examples of acute syphilitic myelitis and four of Erb's spastic type. There is a marked preponderance of males affected by the disease. Among 62 cases described by Kuh there were only six female patients. The process is most likely to occur in the active period of life, so that most of the patients were in the second or third decades of life, when acute syphilitic infection is most frequent. Cold, sexual excess, nervous disposition, alcoholism, trauma, and physical exhaustion have been regarded as of ætiological importance. The date of the syphilitic infection at which acute myelitis may appear varies considerably, ranging from two months after spirochætal invasion, as in one of Dr. Cole's patients, who still had a chancre of the lip and a papular syphilide, to 27 years after infection, as in one of Williamson's cases. The symptoms may develop suddenly within a few hours, or the process may require from several days to a week or more to develop fully. Pain in the back, of which both Dr. Cole's patients complained, and retention of urine are prodromal symptoms, as well as paræsthesiæ, girdle sensation, shooting pains, tiredness in the limbs, and muscle twitchings. Sooner or later complete paralysis of the limbs, in a few cases involving the arms, ensues. Sensation is generally affected. Bed-sores appear early and spread rapidly. There is usually an early infection of the paralysed bladder, the process travelling up to the kidney and resulting in a chronic pyelocystitis. Acute syphilitic transverse myelitis is therefore a severe process, and its termination is often fatal and rapid. Unless seen early the cord lesion causes great loss of irreplaceable tissue. One of Dr. Cole's patients died 37 days after the first pain in the back, and the necropsy showed syphilitic vascular changes and softening of the lumbo-sacral cord with accompanying pyelocystitis, while the other, in whom there were flaccid paralysis of the lower limbs, sphincter paralysis, and bed-sores, made rapid improvement under treatment with injections of arsphenamin and mercurial inunction, so that he regained complete control of his extremities.

[1] Archives of Dermatology and Syphilology, January, 1924.

HYDROGEN SULPHIDE.

USEFUL service has been rendered by C. W. Mitchell and S. J. Davenport in collating knowledge and observations with regard to the action of sulphuretted hydrogen.[1] This gas is formed when organic matter decomposes and it has been the cause of fatalities in sewers; it also occurs occasionally in mines, and is an ever-present danger in certain chemical processes. Nevertheless, as this review of the literature brings out, there is uncertainty as to the changes which occur in the body and result in poisoning. Many have worked at the subject, among others Dupuytren, Magendie, Claude Bernard, Hoppe-Seyler, Laborde, Gamgee, and Harnack. The gas, if concentrated, resembles carbon monoxide in the rapidity with which it may act; the subject appears to drop almost instantaneously. When less concentrated the symptoms of poisoning are proportionately slower in developing and the picture is nearer to that of poisoning by arseniuretted hydrogen. The smell of the gas which gives warning of its presence may explain why more cases do not occur; but a close observer, who once was suddenly overcome and dropped into an adjoining canal whence he was fortunately recovered to tell his story, declared to the writer that when in sufficient concentration to asphyxiate the gas is odourless and is only to be detected by a sweet taste. Possibly the acute cases belong to the anoxæmia series to which Haldane has paid special attention; certainly Haggard has recently suggested that inhaled hydrogen sulphide passes into solution in the blood, where it is rapidly oxidised, the oxygen being obtained from the hæmoglobin. At the same time the products of oxidation combine with the sodium in the plasma, whence may follow the later or more chronic effects of poisoning, such as mental and gastric disturbances and hepatogenic icterus. The review presented is held to establish that hydrogen sulphide is one of the most toxic of gases, comparable to hydrogen cyanide in the rapidity of its action and the concentration from which death will result. Even in concentrations of 0·005, such as may occur in industries, the gas is toxic. It is therefore an industrial poison with which we should be well acquainted.

[1] Hydrogen Sulphide Literature. C. W. Mitchell and S. J. Davenport. U.S.A. Public Health Reports, vol. xxxix., No. 1, January, 1924.

SOPHISTICATED MILK.

AT the present time there is considerable activity within the ranks of the milk trade in regard to improving the methods of production and purveying of milk, particularly as to improvements leading to a diminution in bacterial contamination. The annual report for 1922 of Dr. G. Clark Trotter, medical officer of health for Islington (which has only just reached us), shows that the danger of chemical sophistication still has to be guarded against, and demands unsleeping supervision. His report gives some interesting particulars in regard to milk adulteration and what he describes as an apparently organised attempt on the part of itinerant vendors to foist upon the poorer population sophisticated milk. This took the form of different milk vendors, one

man being at the back of the whole concern and supplying the milk in bulk to each retailer, touring the poorer streets and underselling the legitimate vendors in price, the profit being made up by the use of adulterated milk. Considerable ingenuity was displayed, and one defendant admitted in court that as a general rule all customers who asked for "a pint" or "a quart" were served with the separated, or mixed milk, while those who distinctly specified "milk" were served with the genuine article. Within a period of about four months out of 18 official samples purchased from these vendors eight out of 14 were adulterated, the other four being sold as separated milk. In addition, 36 informal samples were purchased, of which 18 proved genuine and 18 adulterated. The fines with costs in the eight cases in which proceedings were instituted amounted to £35 13*s*., or an average of £4 9*s*. 1*d*. The amounts of fat abstracted ranged from 11 to 51 per cent. below the low legal standard. With these ridiculous fines the paying nature of the trade is very obvious.

Two other groups of vendors were dealt with on the same lines, both of which sold separated and new milk. Discussing one group, Dr. Trotter remarks that they distinguished with great nicety between the customers who asked for "milk" and those who did not specify, the former got the "new" and the latter "separated." In the interest of the children of these poorer districts this kind of fraud should be prevented, and protection given to those who are too ignorant to protect themselves. This could be given by prohibiting the sale of milk and separated milk from the same cart. The one practice should be no more possible than for one and the same itinerant vendor to sell from the one cart or barrow sound meat for human consumption and the class of meat designated as "cat's meat." Special action was also taken against adding colouring matter to milk, and 34 out of 46 samples of milk submitted to the public analyst were found coloured with annatto. Proceedings were taken in 26 cases and fines amounting to £121 8*s*. 6*d*. were obtained, an average of £4 13*s*. 5*d*. per case. It will be noted that the fines per case for this comparatively unimportant adulteration were higher than when fat was heavily abstracted.

Dr. Trotter remarks that at the Dairy Show in the Royal Agricultural Hall in October, 1922, leaflets were distributed and free samples given of both colouring matter and preservative, recommended to be added to milk without any warning that the sale of such milk would be illegal. He adds that no legal action could be taken, for although it is illegal to sell milk with colouring matter or preservative, it is not illegal to sell or recommend the colouring matter or preservative for addition to milk.

FUNCTIONAL TESTS IN RENAL TUBERCULOSIS.

IN the Lennander lecture on renal tuberculosis, published by Prof. G. Ekehorn in *Tubercle* for May, June, and July, 1923, it was stated that "functional tests in ordinary cases of renal tuberculosis are superfluous and therefore of no value." Diametrically opposite views are expressed by Prof. H. Wildbolz, of Bern, in a paper read before the Schweizerische Gesellschaft für Chirurgie.[1] Before he ventures on the diagnosis of renal tuberculosis, he insists on the presence of three signs—tubercle bacilli in the urine, pyuria, and functional deficiency of the kidneys. When this last sign is absent, and the rate of excretion of indigo is normal on both sides, tubercle bacilli and pus in the urine should not, in his opinion, be regarded as proof positive of renal tuberculosis, even if the tubercle bacilli are obtained from a ureter by catheterisation. He has come to the conclusion that functional deficiency of the kidneys is one of the earliest signs of renal tuberculosis, and he comments with surprise on the fact that a small tuberculous focus in a kidney, most of which is histologically healthy, should be able to impair its physiological activities. One of his many arguments in favour of the functional test before proceeding to nephrectomy is that the surgeon, who is unfortified by the findings of this test, may blunder seriously during the operation. For when he has exposed the kidney, it may strike him as looking so perfectly healthy that he has qualms about removing it. He may therefore leave it in place, or commit an even greater blunder—incise the kidney in search of tubercle. Even if he fails to find it, he may have started a fatal miliary tuberculosis by his act. If, on the other hand, the functional capacity of each kidney has been determined separately beforehand, and the kidney selected for nephrectomy has proved to be functionally defective as well as harbouring tubercle bacilli, the surgeon may proceed with equanimity to remove it in its entirety, be the evidence of inspection and palpation at the time of operation never so doubtful. In the course of about 500 nephrectomies for renal tuberculosis, Prof. Wildbolz has not once been misled by the evidence of the functional test, and he has to record only one case of uræmia following nephrectomy. This case occurred about 17 years ago, when his faith in the indigo test was not as confident as it has since become. The test showed delayed excretion of indigo on both sides. This warning was neglected, and the patient died a week after the operation. Post mortem, complete cavernous destruction of the remaining kidney was found. Prof. Wildbolz has little good to say of pyelography, pneumoradiography, and several other tests, the chief charm of which would seem to lie in their novelty.

[1] Schweiz. med. Woch., Jan. 10th, 1924.

EYESIGHT AND AEROPLANE-LANDING.

THE great majority of crashes to aeroplanes occur while landing the machines, and the importance not only of perfect visual acuity, but of good visual judgment in relation to this action has been proved by Comdr. E. C. Clements, R.A.F.M.S., who states[1] that the instructors in our Air Force are sufficiently impressed with the results as to apply at once for an opinion when a pupil shows signs of inability to land. The importance of frequent thorough examination of the eyes of airmen who crash is well brought out in the account of a case given by Major H. C. Neblett, of the Medical Corps, U.S. Army.[2] The patient had been for three years a pilot in the air service, and had no trouble in his eyes up to September, 1919, when he was making a flight at 8000 feet and fell into a series of "tail-spins" to within 1500 feet of the ground. He felt a severe pain in the right side of the head and the right eye, had photophobia and blurring of vision in both eyes, so severe that he could not attempt to land for about a quarter of an hour. The left eye soon became normal, but the right eye suffered for about ten days, and thereafter was very easily tired either by reading or flying. Pain returned six months later, and from time to time subsequently he became, from this cause, unfit for duty. In July, 1921, he crashed, without history of any definitely localised injury, but was for a time unfit to fly, his eyes giving trouble. There were an unusual number of crashes and poor landings in his history. Major Neblett observed him making poor practice landings on Nov. 20th, 1921, when he ultimately broke up his plane, though he was not himself hurt. His eyes were then carefully examined; the visual acuity of the right eye was found much diminished, with lessening of the supra-orbital and temporal field, and an almost complete detachment of the retina from below was found by the ophthalmoscope. Treatment for three months had no beneficial effect and he was retired "on account of practically total blindness in the affected eye." The history of this case shows the importance of carefully examining the eyes of all pilots who find a difficulty in landing.

[1] B.M.A., Section of Ophthalmology, THE LANCET, 1923, ii., 517.

[2] Military Surgeon, December, 1923, p. 605.

CARCINOMA OF BARTHOLIN'S GLAND.

AT a recent meeting of the American Gynecological Society, Dr. Frederick H. Falls,[1] who reported an illustrative case, stated that primary carcinoma of Bartholin's gland was a very rare tumour of which not more than 20 examples had been recorded. The average age of the patients was 52·7 years, the youngest being 29 and the oldest 91. The tumours usually develop after the menopause, which has been regarded as a possible cause. Owing to its peculiar structure two types of carcinoma may develop in the gland—viz.: (1) A squamous-celled tumour from ducts near the surface in uninflamed glands or in deeper parts of the ducts in glands which have been the seat of chronic inflammation leading to alterations in their lining membranes; and (2) columnar-celled carcinoma or adeno-carcinoma arising from the gland acini or from the unaltered duct epithelium in their deeper portions. Metastases frequently occur in the inguinal glands on the same or opposite side. Recurrence is extremely common, as in all carcinomata of the vulva. Sinus formation is common and may be present for years before evidence of malignancy is seen. No instance of bilateral carcinoma of Bartholin's gland has been reported, but in Sitzenfrey's case there was a chronic inflammation of the gland on one side associated with carcinoma of the opposite gland. The symptoms are swelling of the labium in the region of the gland with œdema of the remnants of the hymen. The swelling in many cases is painless at first, but in a few months tenderness and an aching sensation develop. Sometimes there is severe lancinating pain radiating to the coccyx and groin, which is aggravated by walking and coitus, and is usually worse during menstruation. On local examination a hard lump, ranging in size from a hickory nut to an orange, is found. It is freely movable in the early stage, but later becomes fixed to the surrounding structures. The skin over the tumour may be thin and bluish and tends to ulcerate. The course is usually rapidly fatal, but cases have been recorded in which there was no recurrence after three years (Eden) or even six years (Trotta). The diagnosis as a rule is easy. The chief diagnostic points are the age, which is usually over 50, the hardness of the tumour, and its tendency to fixation. Pain, especially if associated with œdema of the vulva and skin over the gland, is very suggestive. Metastases to the regional lymphatic glands, which become hard and shotty, and a tendency of the tumour to break down are important signs. In doubtful cases the diagnosis can be established by biopsy. Treatment consists in removal of the tumour as soon as the diagnosis is made, and the subsequent application of radium and X rays to the affected areas and also to the opposite site and inguinal regions. In Dr. Falls's case, which occurred in a woman aged 38, the tumour was found to be adherent to the levator ani in its lower pole and to extend to the ramus of the pubis laterally. The carcinoma was medullary in type and probably arose from duct epithelium. Removal of the growth was followed by application of radium to the wound and corresponding inguinal region, and later by X ray treatment. At the time of publication 14 months had elapsed since the operation without any evidence of recurrence of the growth.

[1] American Journal of Obstetrics and Gynecology, December, 1923.

ENTERIC FEVERS AND SCAVENGING.

Prof. Harold Kerr, medical officer of health for Newcastle-upon-Tyne, in a paper read before the Epidemiological Section of the Royal Society of Medicine on Jan. 25th, considered the factors influencing the prevalence of enteric fever and diarrhœa. Some 30 years ago a sanitary congress was opened with the remark: "The north countryman dearly loves a privy-midden." It was a surprise to many of Dr. Kerr's audience to learn how many of these evidences of misplaced affection still remain in important great towns of the north. Apparently neither a regard for the amenities of life nor for sanitary improvement has been able to counterbalance the cost, whether to ratepayer or property owner, of abolishing these urban inconveniences. Dr. Kerr set out from the standpoint that formerly the incidence of enteric fever and diarrhœa in a district was a fair indication of the efficiency of its methods for the disposal of excreta and refuse. In the last decade of the nineteenth century many reports by medical officers of the Local Government Board and medical officers of health supported this view. It was shown that privy-midden towns grouped suffered more than water-closet towns grouped from diarrhœa and enteric fever and that the incidence of these diseases was greater on houses supplied by conservancy closets. Dr. Kerr's investigations seem to show that with a lessened prevalence of these diseases it is not so easy to make clear deductions now. The decline of enteric fever has always been somewhat of a mystery and has undeniably preceded in many towns the conversion of the middens. In some cases of badly infected towns the immunising of the more susceptible members of the population, whilst sanitary measures have been put in hand, must have had an appreciable effect. For example, in Sunderland, with a population of under 150,000, more than 5000 cases of enteric fever were notified in the 15 years succeeding the introduction of the notification of infectious diseases. In 1911 Dr. Kerr obtained figures from 41 great towns which he examined for correlation between conservancy methods and prevalence of bowel infections, but he came to the conclusion that other circumstances, such as constitution of population, occupations, habits, wealth, climate, situation and natural amenities, water-supply, drainage, and hospital accommodation, differed so much that it was only fair to compare each town with itself. He found, however, that the conversion to the water-carriage system was invariably accompanied by a decline in enteric fever, though the rate of decline has varied greatly in different towns. The Local Government Board (1910) Report on Enteric Fever in the County of Durham emphasised the primary importance of conservancy methods in maintaining high enteric and diarrhœa rates, but Dr. T. E. Hill, the county medical officer, has since pointed out that efficiency of scavenging is probably quite as important. The inconsistency of the results prompted Dr. Kerr to continue his inquiry in 1921 and to extend it to other factors such as scavenging and the distribution of dried milk. All districts showed a great improvement in the period 1918–22 over 1906–10, and this is specially noticeable when the hot year 1921 is compared with the hot years 1906 and 1908. But there are inconsistencies in the table. Among towns with a high proportion of conservancy closets Hull, Middlesbrough, Wigan, Warrington, and Darlington had high rates for enteric and diarrhœa in both periods; while in Bolton, Derby, Huddersfield, Halifax, and Rochdale the enteric rate is high and diarrhœa low; and in Gateshead, South Shields, St. Helens, and Wolverhampton the enteric rate is low and diarrhœa high. Newcastle, with 8½ per cent. of privies, has slightly more enteric and slightly less diarrhœa than Gateshead with 76 per cent. of privies. Reports on scavenging show high standards on paper which Dr. Kerr thinks are too good to be true. Privy conversion, he concludes, played a notable, if not a chief part in the past, in reduction of enteric and diarrhœa incidence. It is not nearly so clear that conversion to-day is essential to a low enteric rate provided that scavenging is efficient. Modern road-making and methods of cleansing and replacement of horses by motors in general service have all played their part in diminishing disease. The substitution of dried for fresh milk would cut out another link in the chain of communication between midden and man. Popular education, however, and growing civilisation remain the chief means of combating diseases of uncleanness.

B.M.A. ANNUAL MEETING, 1924.

THE ninety-second annual meeting of the British Medical Association will be held in the latter part of July at Bradford, when Mr. J. Basil Hall, consulting surgeon to the Bradford Royal Infirmary, will succeed Mr. C. P. Childe in the presidential chair. The annual representative meeting begins on Friday, July 18 h, at 10 A.M., to be continued on the three following week days. Dr. R. Wallace Henry will again preside over this body. The scientific sections will meet from 10 A.M. to 1 P.M. on Wednesday, Thursday, and Friday, July 23rd to 25th, the afternoons of the same days to be given up as heretofore to laboratory and clinical demonstrations. The usual exhibition of surgical appliances, foods, drugs, and books will be opened on July 22nd, at 9.30 A.M. The annual dinner of the Association is fixed for the evening of Thursday, July 24th. A popular lecture entitled "The Sun Cure" will be delivered by Sir Henry Gauvain on Friday, July 25th. The honorary local general secretary of the meeting, on whom even now the burden must begin to fall, is Dr. W. N. West Watson, Victor Lodge, Manningham, Bradford.

POVERTY IN GERMANY.

OUR Berlin correspondent has referred on more than one occasion to the distressful effects of poverty on the health of the coming generation in Germany, describing unhappy conditions which, in the opinion of many on both sides of the Rhine, constitute a claim on the charity of the world. The British Appeal for Relief in Germany, a body which has made this matter its especial care, nevertheless feels that sufficient information on the actual condition of the children has not yet been obtained, either for a wise administration of large funds or to enable the Committee to press the appeal in an adequate campaign. To endeavour to form some estimate of the true state of affairs, this Committee has arranged for two doctors to go to Germany and to investigate the conditions at first hand on behalf of three organisations—namely, the Save the Children Fund, the Universities' Committee, and the Society of Friends' Council for International Service. In this capacity Dr. Helen Mackay, whose studies on rickets in Vienna have been published in these columns, and Dr. Melville Mackenzie, lately medical officer to the Friends' Russian Famine Relief Unit, for the Friends' Council in Russia, have been asked to make a strict report on the state of nutrition of the children in various districts in Germany, with special reference to those under school age and of the students.

THE IMMUNITY OF CHILDREN TO GASTRIC AND DUODENAL ULCER.

IN connexion with a case of perforated ulcer of the stomach in a girl, aged 7, Dr. Lennart Norrlin[1] draws attention to the remarkable immunity to gastric and duodenal ulcer enjoyed by children over the age of one year. As he points out, every case of perforation of the stomach or duodenum in the large Swedish towns comes to operation or necropsy, and it is thus almost impossible to overlook the accident. In two papers dealing with large statistics and published in Swedish this complication has been shown to be practically unknown in childhood, and of 518 cases of perforation collected by Dr. Norrlin from the Swedish and Finnish literature, there was only one case in which the patient was under the age of 15. This patient was a boy aged 14. But while children above the age of one year practically never suffer from ulcers of the stomach and duodenum, this disease is not rare in the newborn. Thus, Collin has found ulceration of the duodenum in 17 infants among 237 necropsies, and Bonnaire, Durante, and Ecalle have found two such cases among a total of 4000 necropsies. Among 1109 necropsies on infants under the age of one year, Schmidt found 20 cases of duodenal ulcer, the ulcers in several cases being multiple. In seven of these cases death was due to a hæmorrhage from the neighbourhood of the ulcer, and in three cases to peritonitis. In the remaining cases the cause of death was some intercurrent disease. Dr. Norrlin asks: Why should the age from the second year to puberty be so free from gastric and duodenal ulceration, whereas the newborn and adults are so prone to suffer from it? Children are notoriously reckless over what they eat, but they do not have to pay for their recklessness with gastric and duodenal ulcers. If the cause of this immunity could be discovered, light would probably be thrown on the lack of immunity shown by the newborn and adults, and Dr. Norrlin suggests that the determining factor may prove to be the behaviour of the glands of internal secretion.

[1] Acta Chir. Scand., Dec. 22nd, 1923.

Dr. Alfred Mantle, who is president of the Harrogate Medical Society, has just been awarded the prize by open competition in this and other countries for the best essay on the cause and prevention of rheumatic fever, and has decided to devote the awarded £120 to propaganda work for educating the poorer classes as to the prevention of rheumatism in childhood. A considerable percentage of heart troubles are known to be of rheumatic origin in early life, and may be prevented if proper care be taken by an early examination of the throat and mouth, and by the treatment of certain conditions which we know may lead to rheumatism and possibly infection of the heart. The poor are always ready to consider any pains about the limbs in children as "growing pains," and the importance of rest in bed at this time cannot be overestimated, but is neglected, and much can be done to remedy this by medical officers and the children's welfare societies' health inspectors educating the mothers as they have done so successfully in the tuberculosis campaign.

THE latest list of honours contains only one medical name, that of Dr. Henry Jackson, the well-known Mayor of Wandsworth, which is one of the largest of the metropolitan boroughs. Dr. Jackson, who graduated in medicine at Cambridge and at Edinburgh, taking also the degree in science at the University of London, began his scientific career as a worker in advanced chemistry, having carried out researches, singly or in coöperation, on the aldehydes, the derivatives from citric acid, and on glycogen; he is the author of many papers which have appeared in, among other places, the Proceedings of the Royal Society, and the Transactions of the British Association, the Chemical Society, and the Cambridge Philosophical Society. While at Cambridge he was a Fellow and Lecturer of Downing College, but leaving the University for London he soon became a great influence in municipal politics in the district where he went to reside. His work for the borough of Wandsworth has been strenuous and directed throughout towards the public good, so that all political parties in his constituency will approve heartily of the knighthood which has been bestowed upon him. We add our congratulations to theirs.

RENEWAL OF EXCHEQUER GRANTS.—The Ministry of Health announces the decision of the Government to remove the present restrictions on the grants for the development of the public health services—maternity and child welfare, tuberculosis, venereal diseases, welfare of the blind and port sanitation—which are directly aided by grants from the Exchequer. A circular has been issued to local authorities informing them that the Minister will be prepared, with the approval of Parliament, to make grants on the prescribed basis for such further development of these schemes as is considered advisable by the authorities and is within their existing powers, subject to the ordinary process of approval of particular proposals by the Ministry.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LVIII.—THE SURGICAL TREATMENT OF HÆMATEMESIS.

THE causes of hæmatemesis are numerous and with only a few does the question of surgical interference arise. Often the chief problem is to determine the cause, and care must be taken to ascertain that the blood does come from the stomach and is not swallowed and then vomited. In a large group of cases the hæmorrhage arising from the stomach wall is a symptom of some general condition and is rarely in itself a cause of danger or death. These conditions may be grouped as follows: (*a*) Acute specific fevers—e.g., small-pox, typhoid, yellow fever, and malaria; (*b*) toxic conditions—e.g., phosphorus poisoning, acute yellow atrophy of liver; (*c*) constitutional disease—e.g., hæmophilia, profound anæmia; (*d*) back-pressure upon the stomach—e.g., heart disease, cirrhosis of liver. In all these conditions the treatment will be directed mainly against the underlying disorder, or, if the hæmorrhage be severe, will be symptomatic and carried out on medical lines. Though in certain cases of anæmia a splenectomy, or in cirrhosis some operation to aid the obstructed circulation, may have to be undertaken, such steps should never be carried out during or shortly after a severe loss of blood, but should be delayed until the patient's condition has improved.

Acute Gastric Ulceration.

Recent investigations tend to show that in all cases where the loss of blood is due to an acute erosion of the gastric mucosa there are minute ulcers which lead to an aneurysmal dilatation of the small vessels with subsequent perforation and hæmorrhage, and probably in none of these cases is there a diffuse oozing of blood from the mucous membrane (gastrostaxis). The acute erosions may be seen clinically in three different forms: (*a*) As a complication of some acute septic condition; (*b*) as a cause of severe hæmorrhage with few, if any, other symptoms; (*c*) as a cause of the gastric ulcer syndrome in young women.

In Group (*a*) the hæmatemesis may occur as a complication of some septic wound or focus or may arise in a patient who is clearly suffering from a profound septicæmia. In this group the hæmatemesis must be regarded as a serious complication indicative of a widespread septicæmia. The hæmorrhage is often extremely severe, and even if not fatal in itself will add greatly to the danger of the debilitated patient. It is evident that no operation upon the stomach is likely to be curative, but every attempt must be made to combat the infection in the primary focus and to overcome the toxæmia. Oral administration of suprarenal extract, ℥ ii. in an equal quantity of water two-hourly (six doses), is one of the best methods of controlling the hæmorrhage. The patient's anxiety must be allayed by morphia, and after the bleeding has ceased, or, indeed, sometimes before, it may be wise to give a blood transfusion. In my experience horse serum has proved of little or no avail. Operation should only be undertaken at the express wish of the physician; the result will probably be very unsatisfactory, for although the hæmorrhage may be controlled it will be rarely indeed that the septic infection can be combated.

Groups (*b*) and (*c*) differ from Group (*a*) in so far as there is little or no clinical evidence of sepsis. In Group (*b*) the patient—frequently a young woman—will have one or more severe attacks of hæmatemesis unassociated with any other evidence of sepsis or of gastric ulceration. She may have been in perfect health until there is a hæmatemesis sufficiently severe to cause a profound secondary anæmia. The hæmorrhage may be repeated or the single loss of blood may be sufficient to endanger life. In Group (*c*) the symptoms are rather different in so far that the patient—also most frequently a young woman—will have presented for weeks or months pain, vomiting, and loss of appetite, symptoms characteristic of an acute gastritis with ulceration. Here again the hæmatemesis is likely to be severe, and if repeated may be fatal. In this group there has been much discussion as to the advisability of surgical treatment. The type of patient, the absence of periodicity of the symptoms, the relatively short history, the character of the pain, vomiting and loss of appetite should make certain the differential diagnosis of acute from chronic gastric ulcer, and since acute ulcers are often multiple and are associated with an acute gastritis, it is evident that the treatment of choice will be medical. The patient should be kept absolutely at rest and given no food by mouth, her anxiety should be controlled by morphia, and the bleeding diminished by the administration of ice, and if necessary by suprarenal extract. In a few cases, however, the hæmorrhage is so severe or so frequent that operative treatment has to be considered. Only where the patient is in a condition of the gravest danger and where an experienced physician is of the opinion that death will ensue if the hæmorrhage be not immediately controlled should operation be undertaken. Since there is a diffuse gastritis with multiple areas of ulceration no attempt to control a local bleeding point is likely to succeed, and since these patients are often in a condition of severe collapse, no time must be lost in making a useless search for a bleeding point. I believe that the only step which is likely to control the hæmatemesis is a posterior gastro-enterostomy, preferably combined with temporary occlusion of the pylorus, but certain surgeons are sceptical on this point and it is not easy to offer satisfactory proof. If a surgeon is convinced by his own figures that the results of such treatment are unsatisfactory he will be justified in refusing surgical interference. My own view is that a certain group of patients will be saved by such a measure, especially if it be combined with blood transfusion immediately previous to the operation. Among 17 cases, all desperately ill and going downhill, on whom I have performed this operation 11 were cured thereby.

Chronic Gastric and Duodenal Ulcer.

Severe hæmorrhage with a chronic gastric ulcer is not nearly so common an event, and presents less difficulties. If it does occur there may be a large loss of blood which spontaneously ceases, and is unlikely to recur or to be fatal, except if a very large artery is perforated, when the patient dies before treatment can be begun. Acute hæmatemesis in a patient with a definite past history of chronic ulcer is a clear confirmation of its presence and an indication for surgical treatment which, however, should not be carried out until the patient has recovered from the effects of the hæmatemesis. He should be kept at absolute rest in bed, on a modified diet or no food at all by mouth, and on medical treatment to control the hæmorrhage. When his general condition has improved operation should be strongly urged, for the probability of another hæmorrhage or a perforation must be remembered. Rarely the hæmorrhage will be so severe that an operation may hold out the only hope of controlling the bleeding vessel. With a large indurated and penetrating ulcer it is unlikely that the ligature of any vessels will control the bleeding, and safety can probably only be obtained by such radical steps as local excision or partial gastrectomy, procedures which, in a patient profoundly ill, are likely to have a high mortality. These dangers can to a large extent be overcome by a previous blood transfusion, which should be done very shortly before the operation so that there is no further loss of blood between the two steps. In this way there is a good chance not only of saving the patient's life, but of permanently curing the gastric lesion.

Duodenal Ulcer.

Severe hæmorrhage from a duodenal ulcer gives rise to a very similar problem, but here hæmorrhage is a

more dangerous symptom and is more commonly fatal, so that a larger number of cases will demand surgical interference. To-day this is, however, more commonly realised, and hence fewer cases of duodenal ulcer are allowed to progress to hæmorrhage before an operation is advocated. It cannot be too strongly urged (1) that operation should be undertaken as soon as the ulcer is diagnosed and before the onset of the hæmorrhage, and (2) that should the case have been neglected and a hæmorrhage have occurred, operation should be advocated *without* a preliminary course of medical treatment. It is in this that the chief distinction lies between the gastric and duodenal ulcers. The hæmorrhage of a gastric ulcer is likely to cease, and the patient's condition to improve if he be given strict medical attention. In the case of a duodenal ulcer such a happy outcome is not to be expected. The operative steps will also be different, except for the preliminary blood transfusion in any debilitated patients. If the anterior wall of the duodenum be embedded with a running purse-string suture the hæmorrhage can always be controlled, for even if the ulcer be situated posteriorly, so much of the anterior wall can be turned in that the duodenum is entirely obliterated and the bleeding point compressed. A posterior gastro-enterostomy is then rapidly performed so that a permanent cure of the ulcer is probable.

Gastric Neoplasms.

Whether gastric neoplasms are innocent or malignent, they do not, as a rule, call for treatment owing to the severity of the hæmorrhage. When a large vessel is eroded a fatal termination rapidly ensues, but in most cases the hæmorrhage is only one of several symptoms indicating the nature of the lesion ; even if it is severe, treatment will be directed towards radical removal of the tumour rather than control of the bleeding, for if the tumour is inoperable this is almost impossible to achieve with certainty. If, therefore, secondary deposits are present and radical treatment is clearly impossible, reliance should be placed on medical measures alone.

Trauma.

External accidental trauma may occasionally give rise to a small tear of the mucosa, associated with relatively slight and transient hæmatemesis. The presence of such a symptom is, however, always suggestive of a more severe injury. A very careful watch must be kept, and if hæmorrhage be severe or there be the slightest evidence of a perforation—and this usually means early tenderness and rigidity—laparotomy should be immediately performed. In either case the torn portion will be carefully sutured, and the bleeding vessels thus controlled.

Surgical Trauma.

Most operations of gastro-enterostomy or partial gastrectomy are followed by a little loss of blood, but when this is considerable it is often difficult to decide whether the hæmorrhage is due to a rather excessive oozing or whether a larger vessel has not been properly controlled. The milder degrees of such hæmatemesis can nearly always be stopped by cutting off all fluids by the mouth, and giving morphia and suprarenal extract as directed above. Should this not control the hæmorrhage, or should the pulse continue to rise, a second operation, though a severe strain upon the patient, will be essential. I have not yet met with a case where this was required. Hæmorrhage occurring some months or years after a gastric operation is strongly suggestive of the presence of a recurrent or of a gastro-jejunal ulcer, and is an indication for further operative treatment. It is rarely severe or dangerous, but should it be so, the surgical treatment is that of hæmorrhage from a chronic gastric or duodenal ulcer.

Splenic Anæmia.

Splenic anæmia may lead to very severe losses of blood from the gastric mucosa, the local lesion taking the form of acute erosions. Since a considerable degree of anæmia precedes the hæmatemesis, the patient will often suffer much collapse. Wherever possible, therefore, an effort should be made to tide the patient over this before a splenectomy is performed. If the hæmorrhage persists, in spite of medical treatment, transfusion should be performed and the spleen then removed. Even after a successful splenectomy attention should be directed to the anæmia and the general condition, for although the majority of cases are cured by this surgical measure, examples of hæmatemesis occurring several years after the operation have been reported. In such cases the loss of blood is usually from a ruptured œsophageal vein.

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Special Articles.

A REPORT ON THE GEOGRAPHICAL DISTRIBUTION OF CANCER MORTALITY.

A preliminary report by Sir George Buchanan and Dr. Major Greenwood on the International Differences in Mortality from Cancer has appeared in recent numbers of the *Bulletin* of the Office International d'Hygiène Publique, and is the result of the questionnaire sent out in January, 1923.

The Questionnaire.

In view of the vast proportions of the subject and in order to ensure that the returns from the various countries should be comparable, the questionnaire was limited in the first instance to the following points :—

(*a*) The degree to which reliance can be placed on the accuracy of the cancer mortality statistics, having regard (1) to the regulations governing the issue of death certificates, and (2) to the proportion of deaths in which either no medical certificate as to the cause has been furnished, or in which the cause is too obscure or too vaguely described for statistical purposes.

(*b*) Whether statistics are available as to the distribution of cancer mortality according to geographical conditions and according to occupation.

(*c*) Whether information is available as to the proportion of deaths from cancer supervening in hospitals or other public institutions.

(*d*) Whether there are statistics as to post-mortem confirmation of the presence of cancer.

(*e*) How far the classification of deaths from cancer according to the particular organ of the body involved furnishes a reliable indication of the relative incidence of the various forms of fatal cancer.

(*f*) The number of years over which cancer mortality statistics can fairly be compared.

(*g*) Bibliography of cancer statistics available in each country.

(*h*) Any other relevant observations.

General Conclusions.

This preliminary inquiry will, it is obvious, clear the ground for a more detailed comparative study to be undertaken subsequently. Some of the general conclusions drawn from the reports from the different countries are as follows :—

1. There is an almost unanimous belief that mortality from cancer is on the increase, Norway alone not subscribing to this belief.

2. There is a unanimous opinion that all cancer mortality statistics are more or less affected by various sources of error arising mainly from difficulty in obtaining a medical certificate as to cause of death, difficulties in arriving at a diagnosis, and unwillingness on the part of the doctor or of the relations of the patient to admit the existence of cancer.

3. There appears to be no country, save, perhaps, Switzerland, in which any reliable statistics are available as to the proportion of deaths from cancer verified by post-mortem examination.

4. No very satisfactory statistics are available as to the proportion of deaths from cancer occurring in

hospitals or other public institutions. The most complete returns are those afforded by Switzerland, England and Wales, and Sweden.

5. From these and other causes it is difficult exactly to gauge the importance of local differences in the cancer mortality statistics, but these differences appear, at least in part, to be real differences—i.e., they are greater than can be accounted for by variations in procedure in the different countries in matters like diagnosis, registration, and certification.

6. There are striking differences in the different countries in the incidence of cancer of the breast and of the female genital organs. This is strikingly shown in the case of England, Holland, and Italy. For a considerable series of years the mortality in Italy and Holland from these two causes has been somewhere about half the corresponding mortality in England and Wales.[1]

A short abstract follows of the reports from some of the countries which replied to the questionnaire.

Denmark.

Owing to the stringency of the Danish laws relating to death certificates very few deaths occur in which the cause has not been verified by a qualified medical man, while the number of deaths from malignant disease which are included under the heading of "Deaths attributable to unknown or ill-defined causes" must almost certainly be negligible. In Denmark, therefore, the cancer mortality statistics may be looked upon as being as reliable as the present state of medical knowledge on the subject will permit.

Statistics are available for deaths from cancer in each town and rural district. An inquiry into the mortality-rate in various occupations is being conducted, and the results will be published in about a year. Certificates as to the cause of death may be looked upon as equally reliable all over the country, since practically all the doctors have received similar training, and equal facilities are available for medical attendance in every district.—Since 1921 statistics have been published giving the detailed causes of death occurring in most of the hospitals and clinics of the country.—There are no records of verification by post-mortem examination of deaths from cancer.—In most cases the localisation of the malignant disease is stated on the certificate, and save in Copenhagen all certificates not so completed are returned for the information to be added. It is, of course, not always possible to be sure which is the primary site of the disease.—No official statistics are available prior to 1876. Some of the apparent increase in cancer mortality must, no doubt, be attributed to the improvement in diagnosis which is constantly being effected. —Attention is also drawn to the probability that the apparent increase in mortality from cancer is also due to the diminution in the mortality-rate from other diseases, especially from acute epidemic diseases. A table is given correlating the falling tuberculosis death-rate with the rising cancer-rate for each decennium from 1890.

Great Britain.

Statistics from this country are probably reliable as far as the points specified under question (*a*) are concerned, although "senility" may conceal a few deaths from cancer. A greater source of error, however, lies in mistaken diagnoses, and in a certain reluctance on the part of the doctor to certify cancer as a cause of death.

The annual reports and decennial supplements issued by the Registrar-General give the statistics of deaths from cancer grouped according to sex, age, and occupation. While it is probable that not all the statistics are equally reliable, they are considered to be sufficiently accurate for purposes of comparison.—Since 1910 a register has been kept of deaths occurring (*a*) from all causes, and (*b*) from cancer, in Poor-law hospitals and other public institutions.—The information as to post-mortem verification of deaths from cancer is still incompletely furnished on death certificates, the furnishing of this information not being compulsory.—The statistics as to the relative incidence of cancer in the various parts of the body are probably comparatively complete for those cases in which the disease is accessible, the only source of error being the occasional difficulty in ascertaining which was the primary focus of disease.—The statistics for deaths from cancer are probably fairly comparable since 1897.

Italy.

The statistics of deaths from cancer are, on the whole, reliable, although probably vitiated by intrinsic sources of error.

Deaths from malignant disease show an appreciable and progressive increase for the last 30 years (during which period the annual statistics may fairly be compared), contrasting with the sharp decline in the general mortality-rate. —The mortality is greatest among females, especially over the age of 40.—The increase is found chiefly in malignant disease of the gastro-intestinal tract.—Post-mortem verification of the cause of death is only exceptionally undertaken, and bears no relation to the incidence of deaths from cancer.

The Direction Générale de la Santé Publique is investigating the question as to how far such factors as heredity, environment, occupation, and diet are concerned in the increased cancer incidence.

Norway.

The mortality statistics are accurate and reliable for the last 20 years, and in 1918—the latest year for which the figures are given—92 per cent. of all deaths were medically certified. The excellent statistics are ascribed to the facts that the people generally are well instructed on such matters, and that the population is so small as to make details of their social life easy to ascertain.

The regional distribution of cancer in Norway has been studied on several occasions, but not the occupational distribution. This matters the less that most of the people (70 per cent.) live either in the country or by the seaside, as agricultural workers and fishermen respectively, the regional divisions thus representing more or less accurately the professional divisions.—No statistics of deaths from cancer in hospitals or other institutions are available in Norway.—Post-mortem verification is rare.—Up to 1920 specification of the particular region of the body affected was only required in the case of cancer of the skin, digestive organs, breast, and uterus, but since that date the specification has been extended to include, in the case of carcinoma, 26 different localisations, and in the case of sarcoma, three. It is hoped that this information will later show any correlation that may exist between particular types of the disease and particular districts.—There does not appear to have been any appreciable increase in the number of deaths from cancer during the 25-year period over which the figures are comparable.

Holland.

The statistics, on the whole, are reliable as an index of the cancer mortality, but are probably under rather than over the mark, since over 8 per cent. of deaths are registered as due to senility, and nearly 6 per cent. to "unknown causes."

A few statistics are available as to cancer deaths grouped according to geographical regions, but they are too scanty to have more than a local value. A report was made for the years 1908–1911, showing the cancer death-rate among males grouped according to occupation, the occupations showing the highest rates being barbers, hair-dressers, distillers, and telegraphists.—Very scanty statistics are available as to deaths occurring in hospitals or other public institutions.—Very few cancer deaths are verified by post-mortem examination. Those that are so verified occur in hospitals and are precisely the cases in which there has been no doubt as to the diagnosis.—No details are given on the certificates as to the particular organ involved. Old statistics which are available show that the stomach is by far the commonest site of malignant disease, the liver and bile-ducts coming second. The study is now being brought up to date, and the results will be published later.—The statistics are comparable since 1901.—The cancer mortality in the Low Countries has appreciably increased during the last 20 years.

Sweden.

The statistics as to cancer mortality are not so complete or reliable as regards the returns from the rural districts.

There are no statistics relating to the comparative incidence of cancer according either to geographical distribution or to occupation. The incidence, however, appears to be greater in Central Sweden than in the outlying parts—a fact which cannot be accounted for by any difference in the average age of the respective inhabitants, or by a greater proportion

[1] This difference has been chosen by the Office International d'Hygiène Publique and by the League of Nations for an intensive study, which is now proceeding under the direction of a Cancer Subcommittee of the League's Health Committee.

of town dwellers in the former. The difference is tentatively ascribed to the operation of various social factors.—Statistics as to the proportion of deaths from cancer supervening in hospitals and other public institutions are available, and show that an average of 11 per cent. of all deaths occurring in these institutions are due to malignant disease.—There is no post-mortem verification of death.—The classification according to the site of the disease is apparently made in regard to public institutions only. Taking the figures for the year 1920, it was found that the commonest sites of cancer in men are: (*a*) stomach, (*b*) intestines, (*c*) lips, (*d*) skin; and in women, (*a*) stomach, (*b*) breast, (*c*) genitalia, and (*d*) intestines. Cancer of the lips is four times more frequent in the rural than in the urban districts, and is more frequent in small than in large towns. Cancer of the breast and female genital organs is more frequent in Stockholm and in the island of Gottland than in other parts of the country.—There is no definite period over which the returns are strictly comparable, but since 1880 there has been a gradual improvement in diagnosis and in the general level of culture and standard of living; an increase in the number of hospitals and a general prolongation of life; all of which factors tend to produce an apparent increase in the incidence of cancer.

Switzerland.

In spite of a few inherent and inevitable sources of error the Swiss statistics as to causes of death are looked upon as approximately correct. In only a small percentage of cases is the cause of death not specified, the same being true of mistakes in diagnosis. The exact margin of error cannot be ascertained but is almost certainly small.

No statistics are available as to the cancer mortality occurring (*a*) in the various geographical regions, or (*b*) in specific occupations, or (*c*) in public institutions, but such information could in each case easily be furnished.—Whenever an autopsy is held, this fact is entered upon the certificate, so that it would be an easy matter to obtain statistics upon the point.—It would be perfectly feasible to compile from the Swiss statistics tables showing the particular organs of the body affected, not only for the country as a whole, but also in certain specified regions. A study of the correlation between the incidence of special types of cancer in the different parts of the country might give valuable information as to the part played by race, diet, and other factors.—The statistics are fairly comparable since the year 1901.

United States of America.

A reliable indication of the cancer mortality is afforded by the system of registration.

A comparison of cancer mortality statistics from a geographical point of view would be possible, but would be misleading owing to the fact that patients are often transferred to other places in which there may be a better hospital service. The data available as to occupation are at present so scanty as to make statistics on this point also highly misleading.—No statistics are available for the country as a whole to show what proportion of deaths take place in public institutions.—In 21 States the death certificate specifies whether the cause of death has been recognised clinically, at operation, or by post-mortem examination.—As far as the Registration Area is concerned, there are sufficient data for ascertaining the relative proportion of deaths from cancer affecting the different organs of the body.—Statistics for the district of Columbia and for the ten States originally included in the Registration Area are comparable since the year 1900.

Union of South Africa.

Medical certification of causes of death is only obligatory in urban districts, and only as far as Europeans are concerned. Statistics as to the mortality from cancer cannot, therefore, be looked upon as reliable.

For the last four years the geographical grouping of mortality statistics has been adopted. No statistics are available as to the relative cancer incidence in the different industries.—There are at present no data relating to deaths occurring in public institutions.—No post-mortem confirmation of diagnosis is available.—The international classification of causes of death has been in use since 1913, as far as Europeans are concerned.—The statistics for the Union as a whole and for each province are comparable since 1913.—It has been found that among the Europeans of South Africa the cancer incidence approximates very nearly to that in the countries of Europe, while among the indigenous peoples living under primitive and natural conditions cancer is extremely rare.

CHANGING FACTORY CONDITIONS: RISING STANDARDS AND FUTURE DEVELOPMENT.

II.—THE RISING STANDARD OF SAFETY.[1]

IT might be argued that there ought to be appended to the title of this section a question mark, for the statistics are incomplete and unsatisfactory. It is not possible to get even approximately accurate figures as to the number of persons covered by the Factory Acts in different years, but, such as the figures are, they give no clear impression of a diminishing list of casualties, as the corresponding figures for industrial disease most unmistakably do. The standard of notification changes, and the numbers of non-fatal accidents must be taken with some caution, but the number of fatal accidents reported has probably been pretty correct for a good many years past; in statistics, as elsewhere, "stone dead hath no fellow." It is rather discouraging to find that there were 1385 fatal accidents in 1919 and 1404 in 1920, as against 946 fatal accidents in 1909 and 1080 in 1910; these years may be compared fairly because they were all of them years of good trade, though some allowance is to be made for the transition from war conditions to peace conditions in 1919. The figures for the war years being not of much service for comparison are excluded from consideration and the averages are taken for groups of four years, when we get the following results:—

	Average.			
	1902–05.	1906–09.	1910–13.	1919–22
Fatal accidents	1,060	1,071	1,208	1,146
All accidents	94,133	118,971	153,222	113,490

When we take into account extensions of the scope of the Factory Acts—in 1907 laundries were brought in, and also philanthropic institutions—the rising standard of notification helped by the Workmen's Compensation Act of 1906, and the great differences in numbers employed due to trade booms or trade depressions, the broad effect produced by these figures is of some but of no striking improvement. At all events the figures are sufficiently lurid, especially when we remember that they do not include those of the three most dangerous occupations—coal-mining, seafaring, and work on the railways.

In 1910 there was a Departmental Committee on Accidents which recommended among other things more specialisation on the part of the factory inspectorate and frequent conferences with the employers and workpeople concerned. A good deal has been done in both directions. There has been intensive study by particular inspectors of particular industries, and at least one inspector, Mr. L. C. McNair, has shown a remarkable gift for suggesting, and in some cases designing, safeguards. But a limit is set to specialisation by the fact that the whole staff of the inspectorate only numbers 200, that there is much routine work, and much demand for vigilance. Along the line of conference with employers and workpeople, a good deal has been accomplished. The regulations for the very dangerous woodworking trade were the outcome of conference with subcommittees of various joint industrial councils concerned and also with the makers of machinery. Consultation with makers of machinery has proved to be one of the most fruitful lines of action. It is obviously better that guards should be designed simultaneously with the machines, and should be, if possible, an integral part of them, but this has not been so hitherto in the majority of cases. The countersinking of set screws in all revolving parts is an example of what might be done. There has been, as a matter of fact, a great improvement in the design of machine tools during the last 15 or 20 years. But much remains to be done. Each new process and each new material employed in industry bring with them their

[1] The first article of this series appeared in THE LANCET of Feb. 9th, 1924, p. 304.

own special risks for health and safety; thus, the use of celluloid obviously requires special safeguards against the danger of fire.

The outstanding change in the last 20 to 30 years has been the use of electricity both for lighting and as a motive power. There were 107 electrical accidents reported in 1902, of which 4 were fatal; there were 309 reported in 1922, of which 17 were fatal. In this connexion the greatest number of accidents reported in any year was in 1914, when there were 415; whilst the greatest number of fatal accidents was in 1919, when there were 28. When one considers the huge increase in the use of electricity and the risks involved, these figures seem to point to a very considerable measure of success in combating the dangers. The special electrical inspectorate of the Factory Department of the Home Office dates back to 1902, and the elaborate code of regulations came into operation in 1909. Whilst the growth in the number of accidents has fallen far short of the growth in the use of electricity, and satisfaction in that is legitimate, it is yet clear from the annual reports of the Chief Electrical Inspector that many accidents occur, and that several lives are lost every year quite unnecessarily. Contractors sometimes put in inferior material to lower costs, and for the same reason the sub-stations of public authorities supplying electricity are often unduly cramped, and are therefore more dangerous to work in. But the chief cause of accidents is the ignorance or the foolhardiness of the workers. Unskilled men are put to work among dangers which they do not understand, and skilled men deliberately and unnecessarily take risks. "In these cases," wrote the Chief Inspector in 1922, "although the persons meeting with the accidents were themselves at fault, the real blame rested with the responsible management in permitting work to be done under similar dangerous conditions as a normal practice."

The Need for and Value of Warnings and Instructions.

Ignorance, foolhardiness, lack of proper supervision, are, indeed, everywhere among the chief causes of accidents. These can be dealt with by proper measures, and a great deal is being done by that most useful body the British Industrial Safety First Association to spread instruction and enlightenment as to them. The movement is a new one over here, except in the case of one or two well-known pioneer firms, but in America it has achieved an enormous reduction of injuries. There is needed in all works a safety committee of workers meeting regularly with the managers; and there ought to be one person whose special responsibility it is to watch the interests of safety; in large works he should probably be a full-time man and an engineer. A great deal depends upon the proper instruction of newcomers, especially of boys and girls, as to risks and precautions. What is needed afterwards is a steady stream of reminders by poster or bulletin, or by discussion in the shop committee. The methods of advertisement which din into us the merits of a hair-restorer can be applied usefully to impress upon a factory operative that she must keep her hair inside her cap or she will pay a visit to the ambulance room, and may have no hair left to restore.

Some remarkable results are claimed already for Safety First propaganda, as already in use. Of one big paper mills near London it is reported that "in 1920 their employees lost 4235 days through accidents, but in 1921 this figure was reduced to 1225½ days (or over 71 per cent.), though there was only a comparatively small decrease in the total number of persons employed and the total number of hours worked. This meant that not only was there a very big decrease for the workers, their wives and families, in suffering and possibly in permanent disabilities, but also that at least an additional £1200 was paid to them in wages." Any reduction in accidents means also, of course, a reduction in the amount of compensation paid, and it lightens thus a burden which falls first upon industry and ultimately upon the general public as consumers.

The importance of educational methods and of the full coöperation of the workers is shown by the fact that of all accidents reported to the factory department about one-third only are due to machinery, and Mr. Gerald Bellhouse, the Chief Inspector of Factories, estimates that of the remaining two-thirds not more than one-third could be prevented by better safeguards alone. It is interesting to note that the Departmental Committee on Accidents in 1910 was apparently prepared to relegate a large number of accidents to the category of "unpreventable." To-day we are beginning to prevent the "unpreventable" The work of the Institute of Industrial Psychology shows how much hope there is that we may be able to eliminate a number of accidents due either to some mal-adjustment of worker to his tools or materials, or else due to states of mind. In particular scientific vocational guidance is likely to prevent in the future the placing of large numbers of boys and girls in occupations for which by physical and mental make-up they are not well suited.

Risks from Bad Lighting and Fire: The Influence of Pace.

It came out very clearly at the Departmental Committee in 1910 that bad lighting is the cause of a great many accidents. Men stumble in passages and gangways and they may easily do themselves serious harm, especially if there should be scrap metal lying about. Whilst the Home Office has no power to prescribe adequate lighting in ordinary cases, it may do so where there is danger to life or limb; it is prescribed for about half a dozen industries where the dangers are most obvious—e.g., ship-repairing. The next Factory Act is almost certain to require "adequate lighting" as a general provision, and, moreover, power will be given in all probability for the requirement by special order of definite standards of illumination, measured in foot-candle, in different industries. Later on it is possible that a minimum illumination may be prescribed for different processes.

Provision for escape in case of fire is a distinctly weak point in a great many factories. The blame for this must rest partly upon the employers and the workpeople, partly upon the local authorities who have the main responsibility for making and enforcing regulations for safety in this respect. It is the duty of the local authorities to certify new factories to be provided with reasonable means of escape, and it is their further duty to inspect from time to time both new and old factories (except those employing less than 40 persons, and even as to them the local authorities can obtain powers) and to prescribe alterations if necessary. There can be no doubt that many of the smaller bodies do their work very badly; and even in a large city factories of recent erection are sometimes found with doors opening inwards and with other dangerous conditions. Even when a works has proper emergency exits, they are not infrequently blocked up by material or lumber, or it may happen that only a few of the workers know where these exits are. The prime responsibility here must rest with the works manager. Fire-drills at irregular intervals are the best safeguards. Two industries come under regulation as dangerous trades because of special risk of fire: they are manufacture of or with celluloid, and the manufacture of felt hats where inflammable solvent is used. In each case a very important regulation is restriction of the amount of material which may be handled in a given space.

Both the fatigue of long hours and the speeding-up of modern industry have been alleged as causes of accidents. With regard to the former, it would seem to be true of women, but not true to anything like the same extent of men. On the whole its importance as a cause of accidents appears to have been overrated. It is probable that there is more reason to connect a high accident-rate with the high speed of modern industry. Dame Adelaide Anderson, formerly principal lady inspector of factories, has commented on the comparatively few accidents occurring in philanthropic institutions, where the work is often more leisurely

though the guarding may be less efficient. But in the absence of statistics it is impossible to be at all certain. The relation, if any, between speed and accident-rate deserves a great deal more attention and scientific investigation than it has yet received.

The Need for More and Better Preventive Measures against Accidents.

The next best thing to preventing accidents is to have the means at hand for treating them promptly and properly. It is only in the last few years that the importance of first-aid equipment has been realised, and especially its value in preventing all sorts of small wounds from becoming septic, a frequent cause of unnecessary suffering and loss of time. First-aid has been for years past a requirement in the regulations for half a dozen "dangerous trades," but the danger guarded against in most cases was specific poisoning or infection—e.g., by chromates used in dyeing or by anthrax spores; apart from that, first-aid equipment, although not compulsory, has been generally supplied in docks and shipyards, at least in the largest centres. Under that Act it was made a requirement in a number of welfare Orders, covering, amongst other trades, all work at blast furnaces and in foundries, in iron and copper mills, and in other metal works. The new Workmen's Compensation Act makes the provision of a first-aid box compulsory in every factory, and it must be in the charge of a responsible person. Insistence on the need for the immediate treatment of even trivial injuries is also an important part of the Safety First Association's propaganda. They issue posters for display in works, with pictures of germs as large as lobsters, much in the style of infant welfare diagrams.

The general impression derived from a study, both of such statistics as are available and also of the measures taken for the prevention of accidents, is that nothing like the progress has been made in this direction which has been made in the prevention of disease. A good deal has been done to lessen the number of machinery accidents, but by far the greater number of accidents are not directly due to machinery. The most that can be said at present is that attention is again being focused on the very high accident-rate, and that measures are being taken, both under State regulation and as the result of private initiative and propaganda, which it is to be hoped will bring about in the next few years a marked diminution in the number of accidents.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

"Mensæ Medicæ."

THE appalling need which all the brain workers in Germany are experiencing, say Profs. Bier, Bumm, Czerny, His, Goldscheider, and other well-known members of the medical profession in Germany, in an appeal which they have just published in the *Tageblatt*, is being felt in an overwhelming measure by doctors. Large numbers of people are no longer calling in medical aid on account of their inability to pay the fees. This dwindling number of their patients has brought thousands of doctors to such a dire state of need that they have been obliged to seek other ways of earning a livelihood, and the majority of them are in a pitiable condition. Some have even been driven to commit suicide. This need might be mitigated if in the already-existing, or planned, community kitchens in Berlin meals for the doctors—"mensæ medicæ"—could be established. For these meals they should pay a small sum of money, or in certain exceptionally unfortunate cases they might be given free. Dr. Eugenie Schwarzwald has placed at the disposal of the profession the kitchens which were created and are conducted by the Austrian "Friendly Help." What is now wanted is money for carrying on the work in the kitchens and for buying the ood. Appeal is made to everyone who has cause for gratitude to the medical profession to send contributions to the credit of the "Friendly Help" (Department Mensæ Medicæ) at the Bank of Mendelssohn and Co., Berlin W. 8, Jägerstrasse 51; and by this means assist in maintaining the public health.

Bayer "205" in Sleeping Sickness.

Speaking before the Berlin Medical Society, Prof. F. K. Kleine, of the Institute for Infectious Diseases, gave a report of his expedition to Rhodesia and the Belgian Congo to prove the new trypanocidal compound in cattle disease and sleeping sickness. The members of the expedition numbered four, including a bacteriologist and a veterinary surgeon. Cattle disease, as Prof. Kleine explained, is produced by *Trypanosoma rhodiense* conveyed to cattle by *Glossina morsitans*, while sleeping sickness is caused by *Trypanosoma gambiense* and conveyed by *Glossina palpalis*. Some weeks are necessary to develop the virulence of trypanosoma within the glossina. In Rhodesia experiments were made with monkeys, some of whom, however, died from snake-bites. By injections of the compound the experimenters succeeded in keeping infected cattle alive and in a good state of nutrition even when bitten by numerous glossinas. They ascertained that Bayer "205" did not prevent infection, but that by reducing the potency of the virus it greatly modified the disease, so that the animals did not lose weight. In November, 1922, the expedition set out for the Congo where sleeping sickness is endemic. Prof. Kleine explained that there were three stages in sleeping sickness. First the stage of infection, then maniacal symptoms were manifested, and lastly a comatose stage set in. By injections of Bayer "205" the blood was nearly always rendered free from trypanosomes, but sometimes in apparently healthy persons trypanosomes were found in the spinal fluid. In Rhodesia 35 patients were given a subcutaneous injection of 1 g. on the first, the tenth, and the twenty-eighth day, the maximum being five injections. In the Congo 105 patients were given intravenous injections of 1 g. on the first, the third, and the thirteenth day respectively. In two patients only was the trypanosome found in the blood after treatment, and even very grave cases could be cured. Transitory albuminuria sometimes occurred. The percentage of definite cures cannot yet be given, but apparently an infected district may be made healthy by the destruction of trypanosomes in the blood.

Sterilisation of the Unfit.

Dr. G. E. Boeters, a district medical officer of health in Saxony, writing to the *Aerztliches Vereinsblatt*, the official organ of the Aerztevereins-Bund, draws the attention of the profession to the present degeneration of the German race, and in the interests of posterity he proposes the sterilisation of habitual criminals, psychopaths, and feeble-minded people by castration. He contends that already under the present laws this operation is permitted, provided the degenerate has been placed under a guardian and that the guardian has consented to the operation. Dr. Boeters had already made provision for such operations in the State Hospital of Zwickau, Saxony, which is under the direction of the well-known Prof. Braun, President of the German Surgical Association. Hitherto the operation had been performed on men only, and consisted in a resection of the spermatic cords; in the female a resection of the Fallopian tubes would be necessary. In the interest of the improvement of the German race Dr. Boeters advocates that children of school age who are blind, deaf-mute, or imbecile should undergo a sterilising operation. The cost of the operation would be met by the State. Permission to sterilise ought also to lie in the hands of guardians as well as of parents. Defective, epileptic, or insane adolescents who have been confined in an asylum ought, in Dr. Boeters's opinion, to be operated upon before discharge, and permission to marry should be given only after an operation has been performed. This penalty should be imposed on all persons who have committed crimes against public morality and

also on females with more than two illegitimate children. Criminals submitting voluntarily to the operation might be rewarded by the shortening of the time of imprisonment. These very radical proposals have been the subject of discussion in the above journal in which Dr. Juliusberger, a well-known alienist and advocate of abstinence, stated that similar principles had already been put into practice in Switzerland. Prof. Forel, in particular, had advocated the sterilisation of criminals and imbeciles. He also wished the method extended to habitual drunkards. Another correspondent, however, points out that the legality of such operations, even with the consent of the parents or the guardian, is not yet clear and that it is, moreover, very doubtful whether such eugenic operations would have any measurable influence on the race while economic conditions remain unchanged.

SWITZERLAND.

(FROM OUR OWN CORRESPONDENT.)

Unqualified Practice.

I RECENTLY wrote of Appenzell as the only Swiss canton where no medical degree is required for medical practice. In the canton of Glarus, where up till 1920 the same freedom existed as in Appenzell, a popular movement has recently been started with the object of returning to the former practice. An amendment to this effect, however, was vetoed by the cantonal council, the minority consisting of Socialists. With this the question is not settled as it will be brought before the referendum of the electorate. Behind the movement are chiefly herbalists and hydrotherapeutists. The canton of Glarus had good reasons to restrict medical practice to qualified men. Among the unqualified practitioners doubtful elements were frequent, and in the debate in the cantonal council the case of an ex-convict was mentioned. That these quacks have a very flourishing trade, which consists chiefly in postal treatment, is shown by a newspaper advertisement in which one of them put his practice on sale. "Daily income 300 francs, professional knowledge not strictly necessary," it ran in the advertisement.

Cancer Figures.

As in other countries the cancer problem in Switzerland presents a serious aspect. Dr. A. Renaud, of Lausanne, has lately dealt with it from the statistical point of view. In the last ten years 12·8 death cases of cancer to 10,000 inhabitants were recorded per year, or 1 death of cancer to 780 inhabitants. The cancer mortality is 8·9 per cent. of the general mortality and 14·1 per cent. of the mortality of persons above 40 years of age. In Switzerland both sexes have about an equal share in this mortality with a slight preponderance of the male sex. Dr. Renaud's explanation of this fact is that with women cancer of external organs, more easily accessible for diagnostic means, is more common. In Switzerland 73 per cent. of cancer in men belongs to the gastro-intestinal tract, and 50 per cent. in women. Dr. Renaud shows that the increase is confined to cancer of deep organs; he is therefore inclined to attribute the increase to more perfect diagnosis. Sarcoma and carcinoma bear the same relation in both sexes, cancer being 16 times more frequent than sarcoma. In Switzerland the absolute number of deaths from cancer is 4700 per year, from sarcoma 300.

Epidemic Disease.

For a considerable time small-pox of a very mild character has prevailed; no fatal cases have yet been reported. The cantons with compulsory vaccination are signally free from the disease. In order to stamp out the small-pox the Federal Council has issued an emergency order. After notification of a small-pox case all persons inhabiting the same dwellings or who have been in contact with the patient must be vaccinated. If the first small-pox case in a parish is followed within 14 days by another, vaccination of the whole parish or district must be performed. The Federal Government is paying half of the cost of these measures; responsibility for carrying them through rests with the cantonal authorities. In Zurich about 600 persons have been brought before the police courts on account of refusal to submit to compulsory vaccination. The average fine was 50 francs.

Last July the beginning of a rather serious outbreak of poliomyelitis anterior acuta was recorded. In August the total number of notified cases was 41, in September 33, in October 70, in November 47, in December 20. This marked the end of the epidemic, for in the New Year so far only four cases have been brought to notice.

Public Health Services.

MENTAL HOSPITALS SERVICE.

THE annual report of the *West Riding Pauper Lunatic Asylum, Wakefield*, for 1922 contains matter of considerable general interest, which is enhanced by the frankness and decision with which the medical superintendent, Dr. Shaw Bolton, states his opinions on certain points connected with asylum administration. Wakefield Asylum, which retains the old style title in spite of the present vogue for "Mental Hospital," accommodates 2000 patients, and is staffed by six medical officers, all of whom hold a diploma in psychological medicine, a circumstance for which there is probably no exact parallel. The whole of the nursing staff undergo compulsory training for the certificate of the Medico-Psychological Association. Unfortunately, however, only a small proportion of the nurses thus trained have entered for the examination. "This result is most discouraging for the medical and lay officers who are responsible for the lectures and demonstrations, and makes the whole present method of training, examination, and certification little better than a farce. I am personally satisfied that this result is due to the fact that the monetary benefit resulting from training and certification, compared with the increasing wage paid to anyone who succeeds in remaining on the staff, is not sufficient. I recommend that the difference in pay between trained and untrained members of the staff be increased by an arrangement whereby no member of the staff who has not passed the various examinations at the proper time receives any annual increment in wage whatever. At present, after five years of mere service, the wage increment is more than double the monetary benefit gained by a serious worker who has obtained the medico-psychological certificate." This information is of particular interest at a time when the training and status of mental nurses are under consideration, and it is to be hoped that some measure may be adopted which will induce mental nurses throughout the country to seek official qualification.

A summary is given of the pathological work done during the year. More than half of the examinations carried out were Widal reactions. This is explained by the fact that every new patient and every new member of the staff are submitted to this test: agglutination is obtained in from 10 to 20 per cent. of cases, and these individuals are regarded as possible carriers and treated as such. Stanley Hall, where mentally defective children continue to be accommodated, has obtained encouraging results, a number of the children having been taught to do farm and other work. The number of new cases at the out-patient department shows a decrease, a fact which Dr. Bolton attributes in part to hostile and unwarranted criticisms of the asylums which have been made of late, "which have probably caused many cases to seek treatment elsewhere at the hands of the numerous professional and quack psychotherapeutists who are at present flooding the country."

The annual report of the *Crichton Royal Institution, Dumfries*, for 1923 records extensive structural changes, including the erection of new female staff

quarters, and a range of glasshouses in the gardens, providing a supply of fruit for the growth of which the climate of Scotland is ordinarily unsuited. The office of pathologist, which had been vacant for some time, is now filled, and a large amount of varied laboratory work is being done. The proportion of voluntary boarders among the patients is, as usual, a high one, no less than 319 voluntary patients having been under treatment during the year. It is a somewhat remarkable fact that the death-rate among voluntary boarders is actually higher (at 11 per cent.) than among the certified patients (9 per cent.). The causes of death in the case of certified patients are detailed, but in the case of voluntary boarders they are not. Not only is there no mention of the causes of death in these cases in the medical superintendent's report, but the nature of the mental illnesses from which they suffered is indicated only in vague and general terms, and information as to these patients is excluded entirely from the statistical tables. These omissions, on which comment was made in THE LANCET last year, inevitably suggest that patients are being received on a voluntary basis whose mental state might be regarded by some as demanding certification. In any case, it is surprising that no comment on the high death-rate among these patients should appear in the reports of the visiting commissioners. Where voluntary boarders are received on so large a scale as to comprise fully one-half of the acute cases under treatment at any given time, the report of the institution should surely afford information as to these patients in the same form and detail as in the case of the certified. To demand such information is not to attack the voluntary status, or to suggest restricting its application, but rather to protect it from accusations in which such deliberate and pointed silence as this is bound to result.

The report of the *Stirling District Board of Control* for 1922 shows that the number of insane requiring treatment at the Stirling Asylum is increasing. Four of the admissions were attributed to methylated spirit drinking, a habit which is said to be spreading. Two patients were admitted as voluntary boarders, the cost being defrayed by their parish councils, an arrangement of which this is the first example. An outbreak of enteric fever occurred during the year. Among 200 agglutination tests performed with the object of identifying carriers, difficulty was experienced in interpreting the results in the case of ex-Service attendants owing to the persistent effects of army inoculations.

An account in the *Irish Times* of a meeting of the Committee of the *Grangegorman Mental Hospital (Dublin)* shows that an alarming increase in lunacy has occurred in that part of Ireland. Accommodation has to be found immediately for 500 additional patients, and it may be necessary to take over the North Dublin Workhouse for this purpose. It also appears that the Government is demanding further economy in expenditure, which will involve reducing the diet scale. Some feeling has been aroused by a request that demobilised soldiers of the National Army should be given preference in applications for the post of attendant. A member suggested that "the same facilities should be offered to the men who fought for Ireland and were now being released from the jails." The impression produced by the article is that lunacy administration in Dublin is proceeding under great difficulties.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. W. F. Tyndale to be Lt.-Col.

Capt. W. E. K. Coles to be temp. Maj. whilst empld. as Dep. Asst. Dir. of Pathology.

Capt. A. J. Horne retires, receiving a gratuity.

TERRITORIAL ARMY.

Lt.-Col. J. Miller, having attained the age limit, is ret., and retains the rank of Lt.-Col. with permission to wear the prescribed uniform.

Maj. L. A. Avery, having attained the age limit, is ret., and retains the rank of Maj. with permission to wear the prescribed uniform.

Maj. (Prov.) J. E. N. Ryan is confirmed in his rank.

Capt. P. R. Bolus to be Maj.

Capt. B. L. Davis, R.A.M.C., to be Divl. Adjt. 55th (W. Lancs.) Divn., vice Capt. A. E. Richmond, R.A.M.C., vacated.

Capt. W. V. Cavill to be Capt. for service with Haileybury College Contingent, Jun. Div., O.T.C.

Capts. G. Candler and G. F. Denning, having attained the age limit, are ret., and retain the rank of Capt.

Capt. H. G. Kilner ceases to hold a commn.

Lt. E. N. Cook, R.A.R.O. (S. Wales Bord.), is attached for duty with the Portora Royal School Contingent, Jun. Div., O.T.C.

Lt. J. C. MacKay (late R.F.A., T.A.), Lt. G. W. Elkington (late Devon R.), and Lt. C. P. Oliver (late R.W. Kent R., T.A.) to be Lts.

Second Lt. A. W. Sheath (late R.A.F.) to be Second Lt. for service with Berkhamsted School Contingent, Jun. Div., O.T.C.

TERRITORIAL ARMY RESERVE.

Capt. G. R. Girdlestone, from 3rd Southern General Hospital, to be Capt.

INDIAN MEDICAL SERVICE.

The King has approved the retirement of Maj.-Gen. C. H. Bowle-Evans, C.M.G., C.B.E., K.H.P., and Maj.-Gen. Sir G. G. Giffard, K.C.I.E., C.S.I., K.H.S.

Diwan Chand Datta, Mangalore Padmanabha Pai, Muthuswami Nata Rajan, Tonse Panduranga Rao, and Ponathil Balakrishna Kurup to be temp. Lts.

Capt. Bhairon Dayal relinquishes his temp. commn.

ROYAL AIR FORCE.

The following are granted short service commissions as Flying Officers: S. G. Gilmore and T. Glynn.

Flying Officer T. A. G. Hudson is promoted to the rank of Flight Lt.

ARMY DENTAL CORPS.

The first examination of lieutenants before promotion to captain, and captains before promotion to major, in the Army Dental Corps, will be held in October.

SOCIETY OF MEDICAL OFFICERS OF HEALTH: TUBERCULOSIS GROUP.

A MEETING of the Tuberculosis Group Committee was held at 1, Upper Montague-street, London, on Jan. 18th. Dr. Neville Cox pointed out the desirability of uniformity in the arrangement of the annual reports of tuberculosis officers (T.O.) and medical superintendents of sanatoriums (M.S.) and the opportunities presented for collective research. Dr. E. Ward mentioned work that is being attempted in the West of England on the influence of marriage, pregnancy, parturition, and lactation on tuberculosis. It was decided that a subcommittee be formed to draft a scheme for standardising the headings and data of annual reports of T.O.'s and M.S.'s, also to suggest subjects for periodical collective investigation. Coöperation with the Tuberculosis Society, the Society of Medical Superintendents, and the Ministry of Health was regarded as essential. The following were appointed members of the subcommittee: Prof. Lyle Cummins, Dr. T. H. Peyton, Dr. Neville Cox, and Dr. E. Ward. Dr. Lissant Cox was also nominated. The Secretary suggested that an annual report on the work of the committee might be helpful, and Dr. Peyton advised also that a brief account of the meetings should be sent for publication to the medical journals. Payment to metropolitan T.O.'s for consultations at union infirmaries and the circulars thereon were discussed. The view was expressed that the Ministry of Health should be assured of sympathetic coöperation in the case of tuberculosis patients in Poor-law infirmaries, but that if smooth working in the future was to be secured, the conditions of service as regards responsibility, payment, &c., should be clearly defined. A resolution was passed that "The Group Committee is strongly of the opinion that probationary appointments of T.O.'s are undesirable and that the designation of tuberculosis officer should only be applied to medical men with adequate experience of tuberculosis work, such experience to be gained in or at an institution devoted to tuberculosis, and by post-graduate study." Dr. Ward reported that Dr. W. H. Dickinson, of Newcastle, had been nominated by the Society for the League of Nations Tuberculosis Scholarship. Further activities of the Group were discussed, including collective research, greater coöperation between various societies, propaganda lectures, and posters.

Correspondence.

"Audi alteram partem."

ELECTRONIC REACTIONS OF ABRAMS.

To the Editor of THE LANCET.

SIR,—The points about which Abrams's critics want satisfaction appear to be four in number, as follows: (1) accuracy of diagnosis, (2) reality of benefit derived from treatment, (3) exclusion of "suggestion" as the therapeutic factor at work, (4) reasonableness of interpretation of the phenomena. It may, at the outset of what promises to be a full consideration of "E.R.A.," be worth looking at the subject from a general point of view and deciding what must be the ultimate criterion of the work's value.

Accuracy of Electronic Diagnosis is generally held to mean correspondence of "E.R.A." findings with "clinical" (meaning also bacteriological) pictures. In other words an "E.R.A." diagnosis is judged accurate if from it the clinical picture can be correctly deduced. Accuracy in this sense, however, cannot be the chief measure of value. The value of clinical diagnosis depends essentially upon how it serves the purposes of prognosis and treatment. Similarly the value of "E.R.A." diagnosis must be gauged mainly according to these practical considerations; moreover, however interesting a general correspondence between "E.R.A." and "clinical" findings may be, it would be surprising to discover that they absolutely fitted in with one another; for they represent sets of observations on different planes. Knowledge that a patient is infected by the gonococcus does not enable us to conclude that the grosser clinical picture is that of arthritis, though it may be so. In the same way the "60" reaction of Abrams may mean a condition of the tissues often, though not invariably, associated with demonstrable streptococci. After all, why must a new conception of disease be condemned because it is not wholly intelligible from the standpoint of older conceptions? Depend upon it, a new idea will thrive or wither simply according as it proves useful or otherwise in helping the sick.

Benefit from Treatment must be judged impartially in comparison with that derived from other therapeutic measures. For this purpose, in order to satisfy everybody, "clinical" (rather than "E.R.A.") diagnoses, which are definite and have been agreed upon, must naturally form the basis of the investigation.

The *Exclusion of "Suggestion."*—There are few, if any, who will now maintain that "suggestion" can be absolutely and certainly excluded from any form of therapeutics—even if such were desirable, which it is not. Various indications, therefore, which lead us to think that "suggestion" is not the chief agent at work in Abrams's treatment, though very interesting, can never help us to reach a definite conclusion in this connexion. But there is one thing which can help us to do so—namely, a comparison of the effects on organic disease of Abrams's treatment plus "suggestion" with other forms of treatment plus "suggestion."

Interpretation of the Phenomena.—"Reasonable interpretation" of a diagnostic or therapeutic procedure has never been regarded in medicine as the sole index of that procedure's usefulness. Only those who can satisfactorily explain the working of all the measures they employ to help the sick can demand as a necessary vindication of Abrams's methods a complete explanation of the phenomena. Moreover, it is obviously easier for Abrams's critics to say there is nothing in his machines than for his students to furnish an adequate physical explanation of their action. Surely to deny facts which are at present not susceptible of a proper interpretation is to take up what history has proved over and over again to be a mistaken attitude!

General Conclusion.—There are not a great number of complex conditions, including proof of "accuracy" of diagnosis, which must be fulfilled before Abrams's methods can win for themselves a deserved recognition. There is only one condition and that is that the investigated results of his treatment turn out to be thoroughly good and compare favourably with those of other forms of therapeutics. This must be the final and ultimate test; and it is the test by which students of Abrams are quite prepared that his work shall be judged. It is noteworthy that the first reply to the criticisms of "E.R.A." lately begun in the British medical press contains an offer to have the results of treatment along one important line publicly investigated; and the spirit of this offer has but one significance—namely, that Abramsites desire only to maintain a faith based on reality.

I am, Sir, yours faithfully,

Beckenham, Jan. 26th, 1924. J. KENELM REID

To the Editor of THE LANCET.

SIR,—I have no wish to trespass on your valuable space by writing any lengthy comment on the humorous article by Dr. Howard Humphris in THE LANCET of Jan. 26th on the electronic reactions of Abrams; as he says, his information is mostly secondhand. I am, moreover, not in the least desirous of raising any defence of the E.R.A.; I am quite content to let them stand or fall, being judged by their results.

But if Dr. Humphris, or anyone else who would care to test the accuracy of the statements made in this article, cares to put to the proof the statement "with our own knowledge of electricity it would appear to be impossible for any electric current in any form to pass from the intake . . . to the patient," I shall be delighted to give him an opportunity of doing so, on the understanding that he informs you of the result, with a view to its publication in THE LANCET.

I am, Sir, yours faithfully,

JAMES B. TOMBLESON.

Crowstone-road South, Westcliff-on-Sea,
Jan. 26th, 1924.

To the Editor of THE LANCET.

SIR,—In your issue of Jan. 19th you report the demise of Dr. Albert Abrams of San Francisco. In your next issue Dr. F. Howard Humphris relates many details which the lay press have already presented to the public. Because this article on Abrams's Electronic Reactions is only further pabulum for the highly sceptical to laugh over, I scarcely observe anything in the coincidence of these two insertions which upholds the fair honour of our profession, unless it is to open up a discussion on behalf of an enthusiastic and original colleague who has not lived to exonerate himself.

When we had the amazing discovery laid before us by Prof. Rutherford regarding the electrical properties of the atom, we gaped in admiration. Because these investigations were conducted in a truly scientific manner, we did not have sensational lay press reports to depict lurid possibilities as each step was improved upon. Because Abrams lived in a country of advertisement is it not probable that the lust for the sensational had eclipsed the desire for truth? Unless Abrams had succeeded where others had failed, clinically, this natural consequence of jealousy and contempt would not be so apparent amongst his countrymen.

The conclusion that a fair and open mind can easily come to in this country is that "Abrams was the originator of a research into strange phenomena about which we know little." After a study of the various modifications of his instruments one finds that all his followers and "off-shoots" obtain precisely similar phenomena. There are other instances known where observers have noted these same phenomena from different standpoints. Precisely similar abdominal areas dull to percussion *can* be demonstrated on the

human subject when the subject is exposed to the oscillations of a wireless aerial. These areas stand out so decidedly from the surrounding resonance that here we have a phenomenon from which to set out on a criticism of the findings of our dead colleague.

Until an obvious phenomenon of this nature can be explained on a scientific basis we have no right, as sportsmen, to pick out what is immaterial from a dead enthusiast's discoveries. There is too much unscientific data in our own empiricism to justify such an attitude. It is of no ultimate value to science to have the failures of a pioneer pointed out to us. Was there anything fair in sending Abrams a specimen of a rooster's blood with the intention of deceiving him? In this profession of ours we even sign an oath against foul play! It is only an expert who can detect a spurious Bank of England note always. Our advanced position in science gives us a wide view of our ignorance. We cannot blame Abrams for not being an expert, but it is easier to deliver a judgment on the man who delivers the spurious note and hilariously publishes the nefarious result. Somehow it seems far removed from even a scientific intuition.

I am not writing primarily to praise Abrams, but to support the sentiment of the younger generation of our profession. That sentiment is so pleasantly devoid of a besodden sense of prejudice, and is so refreshingly imbued with a desire for scientific investigation into every new roadway which can ennoble our calling, that we are not happy to be left with only one side of a new investigation. Because Dr. Humphris was so fair as to say that his article was not a criticism it is disappointing to observe that he did not dwell on any case where Abrams's methods had preceded definite clinical improvement. It is investigation of this latter nature which will maintain that high standard of respect which the younger readers have for THE LANCET. Such investigation will undoubtedly stimulate interest in the subjects you consider to be worth bringing to our notice.

I am, Sir, yours faithfully,

WM. R. MCCRAE.

Montpelier Rise, London, N.W., Jan. 26th, 1924.

THE EXPLOITATION OF NURSES.

To the Editor of THE LANCET.

SIR,—It ill becomes anyone in the position of Dr. E. Cautley to level accusations and make such sweeping assertions on matters connected with the Nurses Registration Act and its administration by the General Nursing Council, as it is very obvious he is ignorant of the provisions of the Act. May I suggest he studies the Act with the rules and regulations as passed by Parliament, and I imagine he will realise most of his criticism is wide of the mark and quite uncalled for.

Dr. Cautley would make it appear that one examination is required for which a fee of 5 guineas is demanded, whereas two examinations—preliminary, after the first year's training, and a final, after three years—are included in the charge. Out of the 2 guineas charged for the preliminary examination, 1½ guineas is earmarked for payment of examiners, leaving the balance for all overhead charges, such as staff and office upkeep, printing, rent of premises hired for holding examinations all over the country, invigilators, travelling expenses of examiners, &c. The final examination will likewise be a very costly affair, and personally I do not consider the fees will meet the overhead charges. The General Nursing Council have followed the methods adopted by various examining bodies, such as the University of London, in their endeavour to carry out the provisions of the Act with regard to examinations, and when the number of centres in which examinations require to be held is considered it will be realised the examinations cannot be conducted at a lesser fee. Already I have heard of medical men questioning whether it is worth their while to act as examiners, as in their opinion the remuneration would be inadequate.

"Women paying such fees," states Dr. Cautley, "should have some voice in the matter," but surely he is aware that two-thirds of the Council is composed of nurses elected by nurses themselves, the remainder being medical men and members of the lay public, all appointed by the Privy Council, Minister of Health, &c.

I need not enter into his other arguments, but would like to assure your readers the General Nursing Council have no desire to make a profit out of examinations, but they must of necessity ensure that expenses are met, and if it is found that the examinations can be conducted cheaper than contemplated, then undoubtedly the fees would be revised accordingly.

I am, Sir, yours faithfully,

R. DONALDSON,
Chairman of Finance Committee, General Nursing Council.

Hinde-street, Manchester-square, W. 1, Feb. 9th, 1924.

To the Editor of THE LANCET.

SIR,—The letter from Dr. Edmund Cautley in your issue of Feb. 9th appears to me to state the case exceedingly well. As far back as Oct. 25th, 1923, I wrote myself to the Registrar of the General Nursing Council as follows:—

"Thanks for your reply to my letter of the 23rd instant. I am afraid that so far as we are concerned your Council's decision as to examination fees practically settles the case for us, as it will do for a good many more hospitals. Speaking personally, I do not think for a moment that there will be any enthusiasm whatever on the part of fever nurses at any rate to qualify for inclusion of their names upon the Council's register at a cost of 5 or 8 guineas in examination fees in addition to the fee for registration, since they simply cannot afford that amount of money. I am sorry indeed because I am most anxious to see the establishment of a reliable register, but I am very much afraid that its success will be gravely prejudiced by the high fee your Council has decided upon. Under the circumstances, I hardly think it is of any use our offering to coöperate in the examinations."

I am, Sir, yours faithfully,

H. KERR,
Medical Officer of Health; Medical Superintendent, City Hospital for Infectious Diseases.

Health Department, Town Hall, Newcastle-upon-Tyne, Feb. 11th, 1924.

SMALL-POX AND VACCINATION.

To the Editor of THE LANCET.

SIR,—Dr. C. K. Millard's criticism of Dr. J. C. McVail's address on the above subject is clever but not convincing. It is amusing to read in it accusations of special pleading (among other things) when the whole criticism is nothing more than a piece of special pleading for Dr. Millard's pet theory that infant vaccination is an error because modified small-pox masks the disease. For this theory he has to make two assumptions: (1) That natural small-pox is always so severe that it is immediately diagnosed. He should know perfectly well that this assumption is unwarrantable. (2) That modified small-pox is always so mild as to be missed; also an entirely unwarrantable assumption.

Dr. Millard will find it difficult to persuade us that the immunisation of a large and susceptible section of the community for even a temporary period—i.e., generally for nine to ten years, frequently for longer—has had nothing to do with the reduction in the incidence of small-pox, or that in the event of a small-pox outbreak a mass of vaccinated and revaccinated persons is other than an invaluable barrier against the spread of the disease. There are other criticisms to be made.

1. He forgets to mention that, in the Poplar epidemic, two unvaccinated children lost their lives, both preventable deaths if infant vaccination had been practised. What would happen if small-pox of a virulent type were to be introduced into an unvaccinated infant school? Would Dr. Millard be satisfied with "isolation and surveillance of contacts" then? Yet this is what occurred in pre-vaccination

days and has done since (vide the Gloucester epidemic 1895).

2. He omits to mention the special circumstances under which Germany has been placed as regards the importation of infection since 1917. Can he let us know how many of the small-pox cases since 1917 were German citizens who had been twice vaccinated? Until we get this information and some accurate report of the epidemics, then Dr. McVail's adjective of "interesting" is still the correct one, and "disconcerting" must still be applied to the case of Germany before 1917 from the anti-vaccinists' point of view. It would be instructive to see Dr. Millard dealing with the conditions which prevailed in Germany by his methods of isolation and surveillance of contacts.

3. Dr. Millard is advancing in his views, for he is now even prepared to regard the vaccination of contacts as not essential, although in an airy kind of way he talks of it as being "valuable to prevent secondary cases." I wonder in how many towns the medical officer of health can exercise any adequate surveillance of contacts in a small-pox outbreak; and this from Dr. Millard, who in the Leicester epidemic of 1903 vaccinated about 800 contacts. The "modern" methods of control of small-pox, according to Dr. Millard, are isolation and surveillance of contacts. Then I say good luck to the medical officer of health who relies on them. In other words, the good luck of Leicester and not of Gloucester. As far as the experiment of Leicester is concerned, which after all is an experiment in taking risks with child life, Dr. Millard was very adequately replied to by Dr. McVail in "Half a Century of Small-pox and Vaccination." The reply still holds good, and Dr. Millard's case remains the same—a very weak one.

4. We are not quite sure whether the American type of small-pox breeds true, but in any case few medical officers of health would view with any degree of pleasure their districts in the condition of the City of Gloucester last year, and in which other districts are placed this year. Surely all this is not due to the incompetence of medical officers of health. Dr. Millard's other criticism that Dr. McVail's remarks might mislead the Members of Parliament speaks little of Dr. Millard's opinion of the intelligence of the latter. I do not know if Dr. Millard's criticism is intended for publication as an anti-vaccination pamphlet, but one can hardly consider it as a scientific criticism of Dr. McVail's address; why not have published it in the *Vaccination Enquirer* and not THE LANCET?—I am, Sir, yours faithfully,

A. H. G. BURTON,
Medical Officer of Health, Ilford Urban District Council.

Feb. 9th, 1924.

To the Editor of THE LANCET.

SIR,—Dr. Killick Millard has made his position clear. He believes vaccination produces immunity, though he qualifies this statement by the word "temporary," whatever that may mean. Vaccination, he agrees, can prevent doctors, nurses, and contacts developing small-pox, and when successfully performed in babyhood confers some sort of "temporary" immunity, since for periods, varying from a year or two up to 50 or more, it retains its influence by either keeping the subject immune from the disease, or so modifying it that, if he should be so unfortunate as to catch small-pox, he *may* escape death and disfiguration, not know what is the matter, and give the disease to others whose parents did not believe in modern ideas of immunity at the time they were born. These being his views on the efficacy of vaccination, the question of its application to the infantile population seems to rest on other than medical grounds.

Having taken much trouble to convince us that he is at one with the medical profession in their view that vaccination can protect the individual, he next propounds the extraordinary view that it cannot protect the community, as if the latter were some quite distinct entity, and were not made up of individuals. Such an argument makes one sit up and rub one's eyes to make quite sure that one is not in some land of dreams which defy all logic. Further, Dr. Millard is practically asking the individual to sacrifice his life and personal appearance for the sake of the community. "Please do not get vaccinated, because if you get small-pox it may be so mild that you may recover unscarred, and no one can be sure that you have had the disease." I can imagine the reply of the ordinary adult to such a proposition, and if he should object, when of age, to make this sacrifice for the community, why should we place him in such a position when he is a helpless infant. Frankly, I do not understand the position. I can understand a person not believing in the protective power of vaccination, and for such a one to object to infant vaccination is quite logical. But to say that certain preventive treatment is effectual for the individual or a portion of the community, but not for the whole, is incomprehensible.

As for the modern methods, on which Dr. Millard lays so much stress—viz., prompt hospital isolation of patients, quarantine and observation of contacts—it would not do to vaccinate the latter, lest they might get mild small-pox and escape observation—and disinfection, they are neither very new nor very modern, but may better be described as old methods perfected along with our general improvement of public health administration. The most recent methods go far beyond these, and aim rather at the production of natural or artificial immunity by such methods as vaccination and inoculation, coupled with hygiene on physiological lines. The late war showed the extraordinary efficacy of such methods, and these in conjunction with the older ones of isolation and disinfection render the individual and community, to which they are applied, as nearly impregnable to infectious disease—where the infecting agent is known—as is humanly possible. In those diseases such as measles and scarlet fever, where the infecting agent is unknown, Dr. Millard himself has repeatedly called attention to the futility of those "modern methods" he lauds as so useful in small-pox.

If the nation be *not* prepared to allow themselves to become immune by nature's extremely slow, sure, and wasteful method of "natural selection," they *must* be prepared to interfere much more energetically with nature on the modern lines which science daily opens up to us, else infectious disease will never be completely under control till the ordinary "homo sapiens" dies out, and the race is superseded by a new subspecies of supermen, who through untold ages of natural selection have acquired immunity to all the ordinary infections which afflict us now.

I am, Sir, yours faithfully,

R. KING BROWN, M.D.,
Medical Officer of Health, Bermondsey.

Feb. 12th, 1924.

SYNCHYTRIUM AND CANCER.

To the Editor of THE LANCET.

SIR,—That synchytrian parasites pass through chromidial and cytic stages, which correspond with those of the alien bodies that are an inseparable feature of the common human cancers and sarcomas, was stated in an article published in THE LANCET in 1921 (vol. ii., p. 495) under the heading Protista and Disease.

During the past three months I have made a practical study of the *Synchytrium* of the common dandelion and I have found that in some cases, side by side with the well-known nucleated form, which is a conspicuous object in epiderm-cells, there is a dense chromidial form seen not only in the epidermis but also in cells of the mesophyll and even of the vascular bundles. That these dense bodies are a phase of *S. taraxaci* is proved on tracing their career by careful examination of leaves taken at different stages of the disease; they are destined to become sporangia, either in a sorus or of the resting type. In the latter

case much yellow or black pigment is formed from them. These bodies in their dense state, and also when they are expanded into sporangia, and in their new nuclei, capsules, &c. resemble the bodies I have described in various malignant and some other tumours; more especially in squamous epitheliomas.

I am informed that *S. taraxaci* is abundant in the neighbourhood of Aberystwyth from spring to October, especially during June.

I am, Sir, yours faithfully,

London, W., Feb. 2nd, 1924. J. JACKSON CLARKE.

COMMON INTESTINAL WORMS.

To the Editor of THE LANCET.

SIR,—With reference to Dr. William Nicoll's remarks in his paper on the Pathogenicity of Common Intestinal Worms in your issue of Jan. 26th, regarding the need of an up-to-date bibliography containing the more important clinical records of recent years, I may point out that reviews of recent work on the clinical aspects of intestinal parasites with bibliographies have been published by me in the following issues of *Medical Science:* Abstracts and Reviews: 1920, i., 401–4; 1921, iv., 103–9; 1922, vi., 280–7; 1923, ix., 91–6. It is noteworthy that of the 86 papers reviewed, most of which were written from the standpoint of general medicine, surgery, and neurology rather than of helminthology, only 4 had been published in this country, as compared with 26 in the United States, 26 in Germany, 15 in France, 4 in Switzerland, and the rest in other European countries, India, and Japan. Of the 26 American papers, the majority, as was to be expected, deal with hookworm disease, while the large number of articles published in Germany is to be attributed to the extraordinary increase in helminthiasis among all ages and classes of society in that country since the war owing to the prevailing lack of cleanliness and the predominance of a vegetarian diet (Müssig[1]). The recent, though less marked increase of helminthiasis in France, which has been strikingly illustrated by the fact that in the two years following the war one out of every three patients operated on in the Havre hospitals vomited an ascaris after the anæsthetic has aroused considerable interest in the subject, especially as regards the effects of the infestation on the nervous system. Several cases of meningitis have recently been recorded in France closely resembling tuberculous meningitis, not only in their clinical symptoms, but also in the character of the cerebrospinal fluid, the principal differences being the absence of tubercle bacilli and the rapid recovery after evacuation of the parasites in the meningitis caused by worms.

I am, Sir, yours faithfully,

J. D. ROLLESTON.

Grove Hospital, Tooting, S.W., Feb. 6th, 1924.

"AN INTRODUCTION TO SURGICAL UROLOGY."

To the Editor of THE LANCET.

SIR,—In a notice of my small book with this title (THE LANCET, Feb. 2nd, p. 237) your reviewer, while praising the soundness of the actual text, says that the author describes surgical urology "as a 'terra incognita to many practitioners' without justifying his criticism of his colleagues." The words I actually used were (page v.) "seems to be something of a terra incognita"; and they were based, not upon opinions formed by myself, but upon statements made to me by practitioners as to their own lack of familiarity with the subject. Thanking you for this opportunity of clearing myself from the charge of unfairly criticising any of my colleagues,

I am, Sir, yours faithfully,

Welbeck-street, W., Feb. 9th, 1924. W. K. IRWIN.

[1] Münchener medizinische Wochenschrift, 1921, lviii., 1395.

BLOOD-COMPATIBILITY OF MOTHER AND INFANT.

To the Editor of THE LANCET.

SIR,—I am in agreement with the views expressed by Dr. S. C. Dyke in his letter published in THE LANCET of Jan. 26th. When my paper appears, Dr. Dyke will see that there is little, if any, difference in our opinions.

I am, Sir, yours faithfully,

Liverpool, Feb. 4th, 1924. NORMAN B. CAPON.

Obituary.

SIR KENNEDY DALZIEL, F.R.F.P.S. GLASG.

Sir Kennedy Dalziel, surgeon to the Western Infirmary, Glasgow, died on Sunday, Feb. 10th, in his sixty-fourth year. A native of Dumfriesshire, he was born at Merkland, Penpont, in 1861. He received his early education at a private school in Dumfries and studied medicine at Edinburgh University, and qualified M.B., C.M. in 1883. He continued his medical studies in Berlin and Vienna, where he specialised in experimental surgery and pathology. On his return to Scotland he settled in Glasgow and there, little by little, won his way to the front rank among surgeons. In recognition of his prominent services in his profession, particularly during the great war, the King conferred the honour of knighthood on him in 1917. His first appointment was as house surgeon in the Royal Infirmary, and in 1885 he succeeded Sir William Macewen as casualty surgeon for the Central Division of Glasgow, a position which he retained until 1894. In 1887 he was admitted F.R.F.P.S. in Glasgow, by examination. Intimately associated with Sir William Macewen in the Royal Infirmary and with Sir Hector Cameron in the Western Infirmary, Sir Kennedy (then Dr.) Dalziel joined the staff of the Western Infirmary in 1899. He was also for a number of years senior surgeon to the Royal Hospital for Sick Children. His connexion with that institution began in 1891, and he held the appointment until the completion of the scheme for the erection of the new hospital buildings at Yorkhill, in which he took a very active part until it was brought to a successful conclusion in 1914. He was consulting surgeon to the Glasgow and South-Western Railway and to the City of Glasgow Fever Hospitals, and was medical referee under the Workmen's Compensation Act. As a teacher and demonstrator Sir Kennedy Dalziel had many natural gifts, enriched by a wide experience and applied with a sympathetic mind, which contributed in no small measure to the fame of the Glasgow Medical School. He was lecturer on medical jurisprudence and professor of surgery in Anderson's College, Glasgow, and lecturer on anatomy in the Western Medical School.

In his work as an infirmary surgeon and in his private practice, to which he devoted himself unstintedly, he won the esteem of an ever-growing circle, both through his outstanding skill as a surgeon, and through his personal charm and sympathy. His contributions to medical literature, which were considerable, dealt mainly with abdominal surgery[1] and showed the same concise grasp of his subject which characterised his lectures. He also contributed to the proceedings of a number of medical societies in Glasgow with which he was connected. For many years Sir Kennedy Dalziel was associated with the volunteer movement and later with the Territorial Medical Service, where he attained to the rank of lieut.-colonel. On the outbreak of war he was appointed to an important position in the direction of No. 3 General Hospital, Stobhill, and he also rendered valuable war service in many other directions. He was appointed a consulting surgeon to the War Office, and visited the hospitals in France.

[1] See THE LANCET, 1902, ii., 503.

As the son of a farmer, he had a natural bent towards farming and stock-breeding, which he carried out with enthusiasm on his estate of Nether Kinneddar, in Fife. This occupation, which became more than a hobby, claimed more and more of his interest in his latter years, and he was never happier than when on a round of his pastures or stalls with any expert friend.

Sir Kennedy Dalziel, whose funeral took place on Wednesday, Feb. 13th, from Glasgow Cathedral to the Necropolis, is survived by Lady Dalziel and by their family of two sons and three daughters. One of his sons is Dr. George Dalziel, surgeon, Glasgow, who served with distinction in the Royal Army Medical Corps in the war and gained the Military Cross.

WILLIAM CURTIS, M.R.C.S. ENG.

BY the death of Dr. William Curtis, at the great age of 87, on Feb. 8th, Alton, Hants, has lost one of its oldest, best known, and most respected inhabitants. He belonged to a family of medical men who had practised for several generations in the town and neighbourhood, and was known not only as a careful practitioner, but also as a naturalist and authority on geology; with the help of his brother, Dr. John Curtis, he gathered together a large number of most valuable specimens illustrating geology and other branches of natural history, which he presented to the town and which now constitute the "Curtis Museum." Born in 1836, he was educated at one of the Friends' schools, near London, and in 1855 entered St. George's Hospital as a medical student. He qualified in 1858 as M.R.C.S. and L.S.A., and returning to Alton joined his father in practice. In addition to a large private practice he held the appointment of parish doctor and also medical officer to many clubs. It was during his time that a cottage hospital was started and he took a prominent part in its promotion. He retired from practice in 1911. Apart from medical work he gave a large share of his time to affairs in the parish. For the Mechanics Institute he acted as curator of the museum after the death of his father. After extensive research amongst old documents, parish registers, and the Domesday Book, he collected a number of facts which he put together in "A History of the Town of Alton," which he supplemented later by a smaller volume on the "Surrounding Parishes."

He married, in 1874, Miss Annie Withycombe Farthing, a daughter of Mr. Henry Farthing, of Wodington, Somerset.

SOUTH LONDON HOSPITAL FOR WOMEN.—A urological department has recently been opened. Out-patients are seen at this department, 86–90, Newington-causeway, S.E., on Tuesdays, at 1 P.M.

BATH CLINICAL SOCIETY.—A meeting of this Society was held recently at the Royal United Hospital, Bath, Dr. W. P. Kennedy, the President, in the chair. Dr. R. Waterhouse read a paper on Heberden's Nodes, in which he reviewed the literature dealing with the relationship of these nodes to gout. He then described the findings in 66 cases of his own. He did not consider that there was any real connexion between Heberden's nodes and true gout. In his experience patients showing Heberden's nodes derived great benefit to their general condition from hydrotherapy. The nodes themselves were unaffected. The following cases and specimens were exhibited:—Dr. F. G. Thomson; (1) A case of syphilitic enlargement of liver and spleen which had almost cleared up on antisyphilitic remedies; (2) a case of encephalitis lethargica; and (3) one of cerebral embolus following mitral stenosis. Dr. C. A. Marsh and Mr. F. Lace: A case of old epithelioma of the right tonsil successfully removed by operation. Mr. C. Terry: (1) A case of lupus of the hard palate successfully treated by radium; (2) an X ray showing obstruction at the hepatic flexure which was found to be due to a cystocolic ligament. Mr. J. S. Levis: (1) A case of painful feet after gonorrhœa: (2) a specimen of an enlarged thymus from a child of 11 months who died under an anæsthetic. Mr. W. G. Mumford: A specimen of tumour of the left maxilla removed by operation. Mr. C. Kindersley: A specimen of carcinoma of the male breast.

THE PRESENT STATE OF KNOWLEDGE CONCERNING VITAMINS.

THE second edition of No. 38 in the Special Report Series of the Medical Research Council,[1] issued five years after its original publication, is a document of importance in more than one respect. The personnel of the Committee which drew up the 1919 report remains unaltered, except that three names—Mr. W. B. Hardy, Dr. A. W. J. MacFadden, and Prof. C. J. Martin—have been added to it. The fact that additions to the report are more numerous than revisions, and that the masterly introduction to the subject remains almost unchanged, indicates that the mass of work published since 1919 has not materially altered the conception of vitamins set out so clearly in the first edition. As is pointed out, the monograph first appeared at a time when the importance of vitamins was by no means universally recognised. Some critics felt that, in any case, the claims made by the writers of the monograph were too extensive. Those, however, who possessed first-hand acquaintance with the observations and experiments which formed the basis of the statements made were not of this opinion. They were then relatively few; they are now very numerous. Instead of being, as then, almost confined to this country and the United States, actual investigators of the facts are now to be found in nearly every civilised country. Advances have been made, especially in our knowledge of the origin and distribution of vitamins, and the conditions which determine their stability. Much progress has been made also along lines which bring experimental studies into immediate touch with clinical observations and practical experience. The isolation of vitamins in a pure state, however, as yet remains unaccomplished.

The general plan of the monograph remains unchanged except in a few minor details. References do not now follow each chapter, but are more conveniently collected at the end of the book. Vitamin A has now a chapter to itself, following the chapter recording early experimental work on the differentiation of vitamins, which, being mainly historical, has suffered but little change in this edition. Beri-beri and scurvy are dealt with in separate chapters, with vitamins B and C respectively, and the chapter on rickets as a deficiency disease is brought forward to follow these from its former position after the discussion on the Application of Experimental Work to the Practical Problems of Human Diets. This discussion is divided into two sections as before, the relation of vitamins to the dietetic problems of adults differing widely from their paramount importance in the nutrition of infants.

The discussion of pellagra, provisionally included in the first edition among the diseases possibly due to a vitamin deficiency, has been omitted from the second edition. The reason for the omission is that while pellagra must still be regarded as a disease of dietetic origin, no fresh evidence has been brought forward in support of that view, and the latest researches upon the subject point to a quantitative or qualitative defect in the protein of the diet as playing the chief part in the ætiology of this disease.

The influence of diet on teeth is discussed in a brief final chapter. The report has been edited by Prof. A. Harden, F.R.S., to whom the thanks of the Committee are extended.

Vitamin A.

It is admitted that in the present state of our knowledge the nomenclature of the fat-soluble vitamin or vitamins presents some difficulty if confusion is to be avoided. In this report the term

[1] Report on the Present State of Knowledge concerning Accessory Food Factors (Vitamins). Compiled by a committee appointed jointly by the Lister Institute and the Medical Research Council. Second edition. H.M. Stationery Office. *1s. 6d.*

"vitamin A or fat-soluble A" is used to denote the accessory food factor necessary to promote growth, and prevent and cure xerophthalmia (in rats) upon a diet adequate in all other respects. The distribution in natural foodstuffs of this vitamin, its origin and physiological significance, its properties, and the attempts made at its isolation form the substance of Chapter III. While the antirachitic vitamin appears to have a similar distribution to vitamin A, the former term is here used to define a fat-soluble vitamin especially concerned with the calcification of bone, and the properties of this antirachitic vitamin are discussed in Chapter VI. on Rickets. All that is definitely affirmed is that an antirachitic vitamin similar in many respects to vitamin A is a central factor in the machinery of rickets; and the nomenclature outlined above is adopted provisionally and without prejudice to the question of the actual existence of two or more distinct fat-soluble vitamins.

Much work has been done since the issue of the original report on the distribution of vitamin A. The primary sources of this vitamin are found to be in the green leaves of plants and in marine algæ, which are now, with butter, cod-liver oil, colostrum, cod roe, yolk of eggs, and marine diatoms, credited with three crosses, as rich sources of this vitamin. In view of the preference of some veterinary surgeons for unpurified oils, the statement that there is no foundation for the belief that dark-coloured oils contain more vitamin A than "white" oils is of interest. The vitamin content of butter, cream, lard, mutton and beef fat, and milk varies with the diet, breed, and management of the animal from which these are derived. Great interest is attached to the origin and function of the large stores of vitamin A found in the liver of the cod and of many other fish. Fish, like mammals, probably derive the whole of their vitamin A either directly or indirectly from the vegetable kingdom. Investigation has shown that a marine diatom (*Nitzschia closterium*, W. Sm.) is capable of synthesising the vitamin when grown in sterilised sea-water in the light, and further that the concentration of vitamin attained in these organisms is very high. Many other marine algæ also contain the vitamin. These vegetable organisms are not directly devoured by the cod, but form the food of a host of minute animals (copepods, amphipods, larval decapods, and mollusca), which in their turn are eaten by many kinds of small fish and other marine animals, salps, squids, and certain molluscs, and these finally are taken by the cod and other fish. In the cod the vitamin is not confined to the liver, but in the period preceding spawning is found in considerable concentration in the roe, both hard and soft, daily doses equivalent to 0·025 g. and 0·05 g. respectively of the fresh soft and hard roe being sufficient to cause resumption of growth in rats. These amounts should be compared with the 0·2 g. of butter fat and 1–2 mg. of cod-liver oil required for the same purpose.

Isolation.—The greatest progress in this direction is afforded by the discovery that vitamin A remains in the unsaponifiable residue when the fat is hydrolysed in absence of air. When the cholesterol is removed by crystallisation or by precipitation with digitonin the whole of the vitamin is left behind along with the non-cholesterol fraction of the unsaponifiable residue, the exact chemical nature of which is not known. The close relation which exists between the presence of vitamin A in fats and the well-known reaction given by liver oils (the production of a purple coloration when the oil is dissolved in an organic solvent and a drop of sulphuric acid is added) has been pointed out. The intensity of the reaction was found to be roughly proportional to the vitamin-A content of a series of fish-liver oils. It is obvious that there is a close parallel between the two properties, but the necessity for caution is indicated by the fact that although the marine diatom *Nitzschia* has been shown to be rich in vitamin A, the oil extracted from this organism did not give the purple-colour test with sulphuric acid.

Vitamin B.

Though the identity of water-soluble B vitamin and the antineuritic factor are not absolutely established, it is now generally accepted; in this edition of the report they are provisionally regarded as identical. The tables indicating the distribution of this vitamin compiled from preventive and curative experiments on pigeons are mostly unchanged in this edition, but new observations confirming the high resistance to heat and to desiccation of this vitamin are recorded. As to the vitamin-B content of milk, discrepancies between the findings of Gowland Hopkins and those of Osborne and Mendel are recorded, the cause of the discrepancy not having yet been discovered. Attempts at isolation of this vitamin have not been successful. The power to synthetise the substance is possessed generally by plants. Yeast, as is well known, constitutes one of the richest known sources of this vitamin, but the question whether yeast synthesises the substance or merely absorbs it from the medium in which it is grown has not yet been decided, conflicting results having been obtained by different observers.

Vitamin C.

The classical history of the development of the conception of scurvy as a deficiency disease is again recorded and, indeed, can never grow stale. The histological changes in experimental guinea-pig scurvy are set out at some length in this edition, and illuminating diagrams of the changes at the rib-junction are reproduced from a paper published by F. M. Tozer.

The table indicating the distribution of vitamin C in foodstuffs is greatly extended, showing how much work has been done in this connexion since 1919. The substances now regarded as richest in this vitamin include raw fresh green cabbage leaves, swede juice, sprouted cow peas, grape fruit juice, lemon juice fresh and dried, naartje juice, orange juice fresh and dried, raw tomato, tomato juice (tinned). It is noteworthy that grapes have a very low antiscorbutic value. Tomatoes grown in South Africa were found by Delf and Pullinger (unpublished results) to be much less potent than those grown in England. Milk is by no means rich in antiscorbutic. Since fresh cow's milk cannot be considered as having a definite antiscorbutic value, its potency varying considerably with the diet of the cow, the weak point in the many experiments designed to investigate the antiscorbutic properties of various dried milks is that no comparison has been made between the anti-scorbutic potency of samples of the same milk before and after drying. It seems probable on the whole that dried milks of very varied potency are placed on the market, and no generalisation can be made on the subject. Spray process milks may possibly be less effective than roller process, owing to the greater opportunities for oxidation during the treatment.

Boiled milk has not been very thoroughly examined. The effect of pasteurisation on the antiscorbutic vitamin of milk, and in particular the relative effect of different processes, still awaits experimental investigation.

As to resistance to heat and oxidation, vitamin C is very sensitive to oxidising agents. The addition of either acid or alkali to the water in which vegetables are boiled appears to increase the loss of antiscorbutic property. Fruit juices may be dried without serious loss by evaporation in vacuo. The only important fact known about the origin of vitamin C is that it is produced during the germination of seeds.

Rickets.

The work on rickets undertaken since 1919 has been important but has not tended to simplify the problem of its ætiology. The present position is discussed under different headings and summarised as follows:—

Recent work on rickets has proved that there are two outstanding factors involved in the ætiology of this disease: 1. The amount of a substance (antirachitic vitamin) in the diet having similar physical properties and distribution to vitamin A. 2. The degree of exposure to sunlight. In addition, the American school of workers, as the result of

ork with rats, has laid great stress on the absolute and elative amounts of calcium and phosphorus in the diet. Mellanby, working with dogs, attached much importance o the amount and type of energy-bearing foodstuffs and nore particularly the amount and type of cereals eaten.

It is clear that both the antirachitic vitamin and sunlight re normally concerned in the deposition of Ca and P in rowing cartilage and bone. Animal experiments prove onclusively that they are capable of correcting deficient and nbalanced quantities of these elements in the diet and ringing about the formation of normal bone. Much of the ecent experimental work employing rats has centred round he influence of diets with a defective calcium-phosphorus atio. It is not clear, however, to what extent a faulty alcium-phosphorus intake, either from the point of view of bsolute or of relative quantities, is of practical importance n the causation of human rickets. Rickets develops in hildren even when ingesting a fair amount of cow's milk n which the amount of these elements is in excess of their equirements and the relative proportion satisfactorily djusted. In the case of diets consisting largely of cereals, owever, such is not the case, and, in this instance, defective ntake of calcium and phosphorus may well be a contributory ause of rickets.

The importance of the antirachitic organic factor in diet nd of exposure to light has been abundantly demonstrated oth by laboratory experiment and by clinical observation. od-liver oil, the richest known source of the antirachitic itamin, has been proved by well-controlled observations to ave a specific prophylactic and curative value. Similarly, ut to a less degree, milk, eggs, and butter have definite ntirachitic actions. Cow's milk and butter appear to show reat variation in their antirachitic properties, depending pon the diet and management of the cow. The point is ne of great importance and needs further investigation, ut our present knowledge indicates that pasture-fed cows —i.e., animals receiving fresh green food and exposed to unlight—produce a milk comparatively rich in both growth-romoting and antirachitic properties.

The question as to whether the antirachitic factor and itamin A are one or two substances is at the present ime under discussion. The points of similarity and dis-imilarity as regards their properties and distribution have een discussed. It cannot be said that unanimity of opinion n this matter has yet been reached. Sunlight and other orms of light radiation (mercury vapour lamp, carbon arc amp) have been shown to possess preventive and curative ffects on rickets comparable in many respects with those of od-liver oil. The interaction of sunlight and the anti-achitic vitamin has been described above. In infants nd in experimental animals sunlight acts in the direction f correcting the effect of an imperfect diet only if the lefects are not too severe. Thus the light radiation may be egarded either as an economiser of the antirachitic vitamin r as a mobiliser of reserve supplies in the tissues. Sunlight ppears to make safe some diets which are relatively deficient n antirachitic vitamin.

It is now intelligible why rickets is a comparatively rare lisease both in natives living under tropical conditions and n the inhabitants of the Arctic circle. The extra sunshine xperienced by the one set of people makes the smaller mount of calcifying vitamin in their diet do the work arried out by the larger vitamin intake of the Esquimo. People living in the temperate zone under modern industrial onditions of diet are often poorly supplied with both these herapeutic agents, and an intelligent application of the facts vhich have come to light as the result of recent scientific nvestigation may confidently be expected to result in the revention of one of the most serious diseases to which urban opulations are liable.

Diet of Adults and Infants.

The chapters indicating the application of experimental work to the diet of adults and infants have been extended in parts, notably the sections on osteomalacia and night-blindness, following on the work on the under-nourished population in Austria, Russia, and Japan, but their main conclusions remain unmodified. The final chapter on the influence of diet on teeth records the results of work by M. Mellanby on puppies, which, if it can be applied to humans, indicates that the correct feeding of women during pregnancy and of children during the development of the teeth should result in the production of teeth perfectly calcified and evenly arranged in the mouth. If, as seems likely, defectively formed teeth have less resistance to caries, the suggestion seems a natural one that one cause of the great amount of disease in the teeth of children is malformation consequent on bad feeding. Dental authorities have criticised this point of view severely, stating that examination of children has shown that only 3 per cent. possess hypoplastic or badly formed deciduous teeth, while 90 per cent. have teeth ultimately affected by caries. The examination which led to this result was, however, of a macroscopic nature, and M. Mellanby obtained microscopical results in 302 deciduous teeth of children, which appear to show a direct relationship between faulty structure and caries.

Medical News.

ROYAL COLLEGE OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination of the Conjoint Board held from Jan. 8th to Feb. 4th, the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas :—

Medicine.—H. G. Anderson, F. Asker, and A. Barnsley, St. Bart.'s; P. Bauwens, St. Thomas's; R. Bolton, St. Bart.'s; W. R. Bowen, Middlesex; A. J. S. L. Boyd, St. Thomas's; Gwenddolen J. Brooke, Univ. Coll.; Doris D. Brown, Royal Free and St. Mary's; G. H. Buncombe, St. Bart.'s; Edna V. Butler, Bristol; Fanny L. Cattle, Univ. Coll.; J. Chronnell, Manchester; Edith I. Clark, G. E. C. Collis, and H. A. Cowan, Univ. Coll.; S. H. Currie, London; D. Davies, Guy's; D. V. Davies, St. Thomas's; E. C. Dawson, Birmingham; C. H. Devereux, Univ. Coll.; N. B. Dreyer, St. Bart.'s; E. F. Duck, Univ. Coll.; W. H. du Plessis, St. Thomas's; R. H. Dyer, King's Coll.; C. J. East and H. E. K. Eccles, St. Bart.'s; W. S. D. Elder, St. Andrews and St. George's; G. E. Ellis, St. Bart.'s; Marguerite Elnan, St. Mary's; T. P. Evans, Charing Cross; C. A. Francis, St. Bart.'s; Dorothy E. Galbraith, Royal Free; E. B. Garrett, Univ. Coll.; H. Geary, Guy's; W. T. McN. Gentle, St. Mary's; B. Green, Charing Cross; J. L. Griffin, Bristol; N. W. Hammer, Middlesex; J. Hartsilver, St. Bart.'s; L. B. Haye, Univ. Coll.; F. Heckford, St. Bart.'s; R. F. L. Hewlett, King's Coll.; Barbara J. Hick, St. Mary's; Barbara M. Hope, King's Coll.; L. W. Houghton, Guy's; Bessie G. Jemson, London; C. M. Jennings, St. Bart.'s; D. Jones, London; I. Kinsler, St. Bart.'s; J. H. Kok, Middlesex; J. H. R. Laptain, St. Bart.'s; Nancy R. Lewis, Royal Free and St. Mary's; D. T. Lloyd, St. Bart.'s; H. Lord, Univ. Coll.; W. J. E. Lupton, St. George's; E. M. McCausland, Middlesex; A. F. McGlashan, St. George's; G. A. McKaig, St. Thomas's; Lily C. MacKinnon, Charing Cross; R. B. McVicker, St. Thomas's; W. A. Mill, Guy's; J. B. Oldham, and D. U. Owen, Liverpool; G. F. S. Parker, Manchester; A. E. Parkes, St. Bart.'s; W. Parry-Jones, London; H. W. Pearson, St. Bart.'s; Winifred M. Proctor, Durham; G. Ralston, London; M. A. Rana, St. Mary's; H. D. C. Rice, King's Coll.; Lilian E. Robinson, Univ. Coll.; F. W. Roques, Middlesex; Kathleen Shelton, Durham; I. Spiro, Univ. Coll.; L. Statnigrosch, Middlesex; E. V. Suckling, London; G. E. F. Sutton, King's Coll.; Portia K. Taylor, Univ. Coll.; A. Tom, Guy's; G. M. Tothill, Charing Cross; J. R. Tree, Middlesex; Mary M. Turnbull, King's Coll.; C. A. van Rooyen, London; I. R. Vermooten, Guy's; Constance Walters, Cardiff; M. A. Weisman, Manchester; Mary A. Wiles, King's Coll.; G. Williams, St. Mary's; Dorothy Wood, Charing Cross; H. G. Wyatt, London; and Muriel M. Yates, St. Mary's.

Surgery.—S. Abadir, King's Coll.; H. G. Anderson, St. Bart.'s; J. H. Anderson, Manchester; H. Aukland, Liverpool; V. Barkin, St. Bart.'s; St. C. E. J. Barrett, Middlesex; Margarida R. Bensaude, Birmingham; A. G. Bewes, St. Thomas's; W. H. Bradley and R. J. Cann, Guy's; A. N. Coomarasamy, London; D. A. L. Crawshaw and J. C. G. Dickinson, Guy's; Kathleen H. Durance, Royal Free; H. S. Edwards, St. George's; Phyllis V. L. Epps, Royal Free; T. I. Evans, St. Thomas's; W. Evans, London; C. J. Fox, St. Mary's; F. G. France, St. Bart.'s; J. H. Francis, St. Mary's; A. G. D. Gavin, St. Thomas's; W. H. Gervis, Cambridge and St. Thomas's; J. F. Goodenough, Guy's; C. A. H. Green, St. Bart.'s; C. W. Healey, Liverpool; H. N. Hearle, Guy's; D. V. Hubble, St. Bart.'s; J. N. Hudson, Manchester; G. C. Hughes, Guy's; J. G. Hume, St. George's; W. S. Hunt, Guy's; A. G. Hyde, Sheffield; E. Jacobson, London; D. J. Jones, St. Thomas's; D. S. M. Jones and H. M. R. Jones, Middlesex; A. Jowell, Guy's; Dorothy L. M. Keats, Royal Free; D. E. Keefe and A. C. King, London; F. H. King, St. Bart.'s; M. C. H. Kingdon, St. Mary's; H. Levit and F. J. Levy, Guy's; K. S. Lim, Univ. Coll.; W. H. G. M. Line, St. Mary's; Elsa P. Lunn, Birmingham; D. M. Mackay, Middlesex; J. G. McMenamin and D. G. Martin, St. Bart.'s; F. Martin, Guy's; C. A. Moody, St. Bart.'s; G. O. Morgan, King's Coll.; Doris E. O'Doherty, Royal Free; K. O. Parsons, Guy's; E. A. T. Pateman, Charing Cross; T. Peirson, Manchester; A. Perkoff, London; D. B. Phillips and L. M. J. R. Pilot, St. Thomas's; E. B. Pollard and F. K. B. Quanbrough, St. Bart.'s; R. H. T. Rea, Cambridge and St. Thomas's; E. J. Rees, St. Thomas's; R. E. Robinson, Guy's; W. E. Rodgers, London; A. Sherning, Cambridge and St. Thomas's; A. D. H. Simpson, St. Bart.'s; A. E. Smith, Univ. Coll.; R. F. Smith, Guy's; G. G. Stewart, St. Bart.'s; H. Taylor and C. Thomas, London; O. F. Thomas, Manchester; W. G. Thwaites, St. Thomas's; D. S. Todd-White, Guy's; Hermione M.

Usborne, Royal Free; L. C. D. Van Der Borght, Ghent; Dorothy M. Vaux, Royal Free; J. L. le C. Walker and H. C. Warner, Guy's; J. L. Warner, Middlesex; W. Wilkinson and T. J. Wilson, St. Bart.'s; T. E. W. R. Wood, London; and Z. M. Yusef, St. Bart.'s.

Midwifery.—W. M. Abdel-Malek, Birmingham; H. M. Allen, McGill; C. A. Amesur, St. Thomas's; A. J. Amor, Middlesex; J. H. Anderson, Manchester; S. M. Anderson, Middlesex; E. C. Archer, St. Thomas's; F. Asker, St. Bart.'s; E. A. Aslett, St. Mary's; H. Aziz, Manchester; R. M. Barron and P. Bauwens, St. Thomas's; P. S. Bell, Westminster; R. J. I. Bell, St. Bart.'s; Margarida R. Bensaude, Birmingham; P. C. Bennison, Guy's; H. E. Blake, Guy's; W. R. Blunt, St. Thomas's; P. G. Brain, London; A. D. Briscoe, St. Thomas's; J. H. Broadhead, Guy's; T. H. P. Brooks, London; A. C. Brown, St. Bart.'s; D. M. Brown, Birmingham; G. A. H. Buttle and C. W. Carter, Univ. Coll.; J. Carver, London; T. E. Cawthorne, W. T. R. Chapman, and F. W. Charman, King's Coll.; M. N. Chatterjee, Birmingham; R. J. K. Chattey, Middlesex; Gwendoline Chave, St. Mary's; F. E. Chester-Williams St. Bart.'s; A. M. Claye and F. Clegg, Leeds; Doris M. Collins, Royal Free; L. C. Cook and W. S. C. Copeman, St. Thomas's; H. A. Cowan, Univ. Coll.; E. J. Creais and M. Cutner, St. Mary's; R. R. Dalling, Liverpool; S. H. Daneel, Guy's; H. E. Daniel, St. Bart.'s; A. F. C. Davey, Manchester; A. Davies, Middlesex; E. W. P. Davies and J. Davies, Westminster; S. C. Davison, Guy's; R. Y. Dawbarn, Liverpool; E. C. Dawson, Birmingham; Charlotta D. N. De Wilde, London; N. A. Dickinson, Manchester; J. M. Dobie, St. Thomas's; J. Dreadon, Otago; G. D. Drury, St. Bart.'s; Margaret H. Duncan, London; S. F. Durrans, Guy's; C. J. East, St. Bart.'s; A. B. Eddowes and H Scott-Edwards, St George's; J E. Elam, St Bart.'s; W. S. D. Elder, St. George's; O. M. Ellis, Cardiff; J. B. Ellison, St. George's; H. G. English, Univ. Coll.; G. I. Evans, Manchester; D. W. G. Faris, London; N. B. Farman, Charing Cross; W. J. C. Fenton, London; J. W. Field, Birmingham; F. E. Fox, London; D. B. Fraser, St. Bart.'s; T. M. Fripp, Guy's; C. J. Fuller, Univ. Coll.; F. F. Fuller, Liverpool; J. A. Galletly, Middlesex; M. Geaney, Sydney; N. C. Ghose, Middlesex; G. Gillett, Univ. Coll.; A. Glen and I. Gluckman, London; B. Green, Charing Cross; C. A. H. Green, St. Bart.'s; A. L. Greenway, King's Coll.; W. J. Griffiths, Liverpool; K. H. A. Gross, St. George's; Kathleen M. Halloran, Royal Free; J. F. Hamber, King's Coll.; C. L. Harding, St. Bart.'s; H. E. Hargreaves, Charing Cross; S. Harris, St. Thomas's; C. W. Healey, Liverpool; F. Heckford, St. Bart.'s; S. Helberg, Zurich and London; J. P. Helliwell, St. Mary's; R. F. L. Hewlett, King's Coll.; Barbara J. Hick, St. Mary's; H. Hinchco, Middlesex; L. W. Houghton, Guy's; J. N. Hudson, Manchester; Theresa H. Humphries, Royal Free; J. T. Hunter, St. Bart.'s; W. E. Hunter, Manchester; J. Hwa, Birmingham; A. G. Hyde, Sheffield; E. Jacobson, London; J. S. Jacobsz, Guy's; J. W. Jeffery, St. Mary's; Mary Jennings, Royal Free; C. W. W. Jeremiah, Middlesex; H. A. Johnson, Birmingham; F. M. L. Jones, London; Helen V. Jones, St. Mary's; L. E. Jones, St. Thomas's; R. M. Jones and A. Jowell, Guy's; D. L. J. Kahawita, King's Coll.; Dorothy L. M. Keats, Royal Free; G. W. Keele, Univ. Coll.; C. E. Kilmister, St. Thomas's; F. H. King and J. F. L. King, St. Bart.'s; J. G. Kingsbury, Guy's; P. H. Knowles, Bristol; T. C. Lewis, St. Bart.'s; K. S. Lim, Univ. Coll.; W. E. Lock, Middlesex; G. K. Loveday, St. Bart.'s; C. J. Lovering, Middlesex; E. S. S. Lucas, St. Thomas's; Elsa P. Lunn, Birmingham; Gladys E. McCabe, Royal Free and St. Mary's; J. McCunn, London; W. S. Macgowan, Middlesex; R. R. Mackenzie, Guy's; D. Magrath, Birmingham; J. R. Maleri, St. George's; J. L. B. Marais, St. Bart.'s; Evelyn D. May, Birmingham; L. M. Maybury, Univ. Coll.; Gertrude M. Mayhall, Leeds; B. A. J. Mayo, St. Bart.'s; S. P. Meacock, Guy's; A. W. C. Mellor, St. Bart.'s; J. D. Mills, Oxford and St. Thomas's; G. G. Milne, London; W. J. Montague, Guy's; J. G. Morgan, Univ. Coll.; C. A. Mulligan, Manchester; E. L. Newell, St. Thomas's; J. A. Noot, Cardiff; M. C. O'Connor, St. George's; Doris E. O'Doherty, Royal Free; G. C. B. Oliver, St. Mary's; L. J. Panting, Middlesex; W. E. C. Parry, Univ. Coll.; E. A. T. Pateman, Charing Cross; R. Paton, Middlesex; F. L. Patterson and Sybil de H. R. Pattison, London; R. M. Pearce and T. Peirson, Manchester; M. S. Pembrey, St. Bart.'s; J. E. Piercy, Guy's; K. F. Platt, Bristol; L. M. J. R. Pilot, St. Thomas's; G. H. Pitt, Guy's; L. Platzky, B. Policovsky, and T. B. Prys-Jones, Middlesex; C. Rankin, Liverpool; R. J. Rankin, Cardiff; F. C. Read, King's Coll.; W. Richards, St. George's; D. Riley, St. Thomas's; J. B. W. Roberton, St. Bart.'s; W. M. Roberts, Manchester; W. G. Roberts, Guy's; C. H. H. Robertson and G. R. Rolston, London; F. W. Roques, Middlesex; Alysoun H. Rowntree, Royal Free; Winifred M. Sampson, Univ. Coll.; H. B. Savage, St. Bart.'s; C. M. Scott, Charing Cross; S. Q. Servante, Middlesex; A. B. Slack, Manchester; K. S. M. Smith and J. S. Spickett, St. Bart.'s; A. A. Spiro, Manchester; R. Stanford, London; R. Stuart, St. Bart.'s; K. H. Tan, Middlesex; Catharine F. Taylor, Royal Free; E. W. P. Thomas, St. Thomas's; J. E. Thomas, Cardiff; W. S. Thomas, Univ. Coll.; F. S. Thornton, St. Thomas's; P. W. Tobin, St. Mary's; P. G. Trafford, T. G. Tresidder, and L. A. S. Trott, Guy's; E. J. Warburton, Manchester; H. A. Ware, St. Bart.'s; H. C. Warner, Guy's; R. L. Washington, Birmingham; M. A. Weisman, Manchester; Joyce E. M. White, London; V. E. Whitman, Cardiff; C. R. Williams, London; H. K. Williams, Guy's; R. E. Wolfendale, Manchester; J. Wood and H. M. Woodman, King's Coll.; G. P. Wright, Univ. Coll.; A. J. Wrigley, St. Thomas's; and H. G. Wyatt, London.

UNIVERSITY OF LONDON.—Dr. Charles Singer, lecturer in the history of medicine at University College and Hospital, will give three lectures, illustrated by lantern slides, on Mondays, Feb. 25th, March 3rd and 10th, at 5 P.M., in the large lecture theatre, University College Hospital Medical School, Gower-street, W.C. 1. The lectures are open to all students of the University of London, and the subjects are (1) the history of syphilis, (2) the history of plague, and (3) the history of small-pox and its relation to inoculation and vaccination.

A course of four lectures on Blood will be given by Prof. B. J. Collingwood at St. Mary's Hospital Medical School, on Thursdays, Feb. 21st, 28th and March 6th and 13th at 5 P.M. Attendance at this course is recognised in connexion with the B.Sc. (Hons.) degree in physiology. Admission is free.

MEDICO-LEGAL SOCIETY.—A meeting of this society will be held at 11, Chandos-street, Cavendish-square, London, W., on Tuesday, Feb. 19th, at 8.30 P.M., when a discussion on the Law of Nullity of Marriage will be opened by Dr. S. Henning Belfrage, followed by Mr. H. W. Barnard.

ST. MARK'S HOSPITAL.—The eighty-eighth annual general meeting of this hospital was held at the Mansion House, London, on Feb. 8th, when an appeal was made for a balance of £12,000 for the extension of the hospital buildings in the City-road. This extension would enable the governors to provide another 21 beds and would also add to the accommodation for out-patients, 1184 of whom made 3951 attendances last year. Further information can be obtained from the Secretary, St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum, City-road, London, E.C. 1, to whom contributions should be sent.

MANCHESTER BABIES' HOSPITAL.—Post-graduate lectures at this hospital are being held on alternate Fridays until April 11th. To-day (Friday), Feb. 15th, Dr. W. Dyson will lecture on Fungus Infections in Children. On the 29th Dr. Catherine Chisholm will give a demonstration of the Treatment of Rickets by the Mercury Vapour Lamp, with Radiographic Illustration of Repair in Rachitic Bone. On March 14th Dr. Nesta Wells will speak on Infection in Infants' Wards. On the 28th Dr. C. E. Jenkins will discuss Vaccines and their Use in the Treatment of Infants, and on April 11th Dr. Chisholm will deal with Complications met with in the Treatment of Marasmic Infants. The lectures will be held at 5.30 P.M.

ROYAL SANITARY INSTITUTE: RECEPTION TO FOREIGN HEALTH OFFICERS.—The reception arranged at the Institute on Tuesday, Feb. 5th, for the medical officers visiting this country under the auspices of the League of Nations, proved a great success. Representatives were present from the Argentine, Austria, Czecho-Slovakia, Denmark, Ecuador, Esthonia, France, Germany, Italy, Latvia, Norway, Poland, Portugal, Roumania, Russia, Sweden, Ukrainia, and the United States of America. The guest were received by Sir John Cockburn and Dr. Louis Parkes, and among those present were four medical Members of Parliament, Dr. W. A. Chapple, Dr. L. Haden Guest, Dr. E. G. Spero, and Dr. J. H. Williams, three officers of the Ministry of Health, representatives of the League of Nations Union, Surgeon-Commander T. B. Shaw, R.N., Royal Naval College, Greenwich, and Mr. P. G. Blazer, secretary of the Labour Party Public Health Subcommittee. The medical officers spent a week in London visiting places of hygienic interest, and then divided into small groups to visit some of the large towns, returning to London in April.

MEDICAL SOCIETY OF LONDON: *Lettsomian Lectures, 1924.*—The syllabus of the Lettsomian Lectures on the Treatment of Pulmonary Tuberculosis by Dr. R. A. Young has now been issued. The first lecture, to be delivered on Feb. 18th, at 9 P.M., will deal with the history of the treatment of pulmonary tuberculosis; the nature and origin of the disease—variations in type; the principles of treatment and the forms of treatment available; and the choice of treatment for individual cases. Home, hospital, sanatorium, and climatic treatments will be discussed, also general management and diet, and the rôle of rest and of exercise. The second lecture on March 5th will be devoted to curative treatments: (1) Specific—tuberculin, serums, and vaccines; (2) chemiotherapy; (3) organotherapy; (4) mineral treatment; (5) physical treatments—heliotherapy, other light treatments and X rays, symptomatic and palliative treatments, managements of advanced cases, after care and vocational training. At the third lecture on March 17th mechanical and surgical methods of treatment will be discussed, including local limitation of movement; artificial pneumothorax treatment—indications and contra-indications; thoracoscopy and the method of dealing with adhesions; phrenicotomy; pneumolysis and apicolysis; thoracoplasty—its varieties, indications, and contra-indications; other surgical procedures; the rôle of surgery in the treatment of pulmonary tuberculosis.

HUNTERIAN SOCIETY.—The annual dinner of this ciety was held on Tuesday evening, Feb. 12th, at the otel Victoria, London, when Sir Bruce Bruce-Port r esided over a large and successful function, at which any ladies were present. Sir Humphry Rolleston, in ving the toast of the Hunterian Society, congratulated ie members on the rapid increase in their numbers, and ommended the principles under which the society was anaged as conducing to intimate interchange of views. Sir ruce Bruce-Porter replied briefly, and introduced, for the rst time in Hunterian celebrations, the personality of is. John Hunter, whose coöperation and sympathy were f such value to her husband in his arduous life. Mr. ohn Adams proposed the health of the Lord Mayor of ondon, who had, like previous Lord Mayors, shown much indness to the society, when Sir Louis Newton, in his ply, pointed out that the public health of the City was a gitimate source of civic pride. Dr. H. A. Ellis, speaking the toast of the sister societies, to which Sir William ale-White replied, made a stirring appeal for a real union etween the mother country and the dominions, his words eing received with great applause. Dr. Howard Humphris as brief and witty in his introduction to the company their guests, for whom Viscount Long, Mr. Justice orridge, and Mr. Hugh Edwards, M.P., replied. The inner closed with tributes to the President and Dr. ortimer Woolfe, the hon. secretary of the society.

PEOPLE'S LEAGUE OF HEALTH.—The Sims Woodhead series of ten weekly constructive educational ealth lectures are being held at the house of the Medical ociety of London, 11, Chandos-street, Cavendish-square, ondon, W. On Feb. 18th Prof. M. S. Pembrey will deal ith the Anatomy and Physiology of the Circulatory and espiratory Systems, and subsequent lectures will be given y Sir Frederick Mott, F.R.S., Sir Harry Baldwin, Prof. J. C. rummond, Dr. J. Mellanby, Sir W. Arbuthnot Lane, Prof. J. R. Kenwood, Mr. E. B. Turner, and Dr. A. F. Tredgold.

THE ENDOWMENT OF A HOSPITAL BED: THE OWER OF A FARTHING.—A farthing per week fund subscribed by employees in the Dunlop factories has produced 100 (96,000 farthings) to endow a bed in the Birmingham nd Midland Area Hospital for Children. The Council of ne Dunlop Hospital and Benevolent Fund, with whom the lea originated, have decided to use one-third of the arthings collected from their thousands of workers for rphanages and other charities, the remainder being devoted the endowment of beds in the various local hospitals. It hoped that within a few years the weekly offering of arthings will have enabled the fund to endow a bed in each Birmingham hospital. The idea might well be imitated by ther industrial undertakings throughout the country.

GLASGOW UNIVERSITY.—Sir Leonard Rogers, who is ecretary of the British Empire Leprosy Relief Association, elivered a lecture in the medicine class-room of the Univerity on Feb. 6th. The lecturer pointed out that the lepers f India were distributed in relation to the rainfall, except districts where the houses were not thickly aggregated, nd that this association was explainable on the assumption hat the bacillus required moist heat for its most favourable rowth. The modern conception of the disease was that was neither infectious nor hereditary, and only a trifling umber of those who lived in close association with lepers eveloped the disease. He then described the principle nderlying the treatment of leprosy by means of intraenous injections of the active principle of chaulmoogra il, in the form of the soluble salt, sodium chaulmoograte. similar lecture was given by Sir Leonard Rogers at the eekly luncheon of the Glasgow Rotary Club on Feb. 5th.

THE Glasgow Western Infirmary Resident's Club eld its annual dinner and meeting on Feb. 8th under he presidency of Dr. J. Galbraith Connal. About 70 old esidents were present.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.—A linical meeting of this society was held in the society's hall n Feb. 7th, Dr. G. M. Duncan, the President, in the chair. Dr. W. F. Croll showed a case of congenital heart disease, nd briefly commented on the differential diagnosis of four roups of such cases. Prof. Ashley Mackintosh demontrated a case simulating carcinoma ventriculi, in which, owever, the blood count was more suggestive of pernicious næmia. Mr. Gordon Bruce showed a case of Charcot's isease, affecting the knee-, elbow-, and finger-joints. Dr. J. . Christie demonstrated a series of cases of skin disease hich included xanthoma multiplex in an infant: lupus rythematosus; dermatitis exfoliativa complicated by ityriasis; rubra pilaris; lichen planus annularis; ulcus odens superficialis; and an unusual form of lupus vulgaris.

Parliamentary Intelligence.

HOUSE OF COMMONS.

TUESDAY, FEB. 12TH.

PARLIAMENT reassembled on Tuesday, Feb. 12th.

Small-pox Outbreak.

Sir KINGSLEY WOOD asked the Minister of Health what steps he was taking to deal with the serious outbreak of small-pox in various parts of the country.—Mr. WHEATLEY replied: The responsibility for dealing with an outbreak of small-pox rests upon the local authorities and their officers. I may, however, say that at present there are only seven districts in which there is any considerable number of cases, and the medical officers of my department are rendering all possible assistance and advice to the authorities of the affected areas.

Supplies of Calf Lymph.

Mr. MARDY JONES asked the Minister of Health whether he was aware that private medical practitioners experienced difficulty in obtaining supplies of glycerinated calf lymph of the same guaranteed purity as that supplied to public vaccinators by the Ministry of Health; and, as many persons desirous of having vaccination or re-vaccination performed by their own medical advisers should have similar guarantees with regard to the purity of the lymph used by those extended to persons vaccinated by public vaccinators, would he take steps to secure the necessary powers to enable private medical practitioners to secure supplies of such lymph at a reasonable charge from Government sources.—Mr. WHEATLEY replied: As regards the first part of the question, I am advised that there is no difficulty in obtaining from reputable firms supplies of glycerinated calf lymph of reliable quality. The action suggested in the second part would involve a large and costly extension of the present Government supply which I am not prepared to recommend.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY, Burlington House, W.

THURSDAY, Feb. 21st.—4.30 P.M., *Papers to be read:* C. Tate Regan: The Morphology of a Rare Oceanic Fish, *Stylophorus chordatus* Shaw, based on Specimens collected in the Atlantic by the *Dana* Expeditions, 1920–22. F. P. Slater: A Sensitive Method for Observing Changes of Electrical Conductivity in Single Hygroscopic Fibres. (Communicated by Dr. W. L. Balls.) T. S. P. Strangeways: Observations on the Formation of Binuclear Cells. (Communicated by W. B. Hardy.) J. A. Crowther, Sc.D.: Some Considerations Relative to the Action of X Rays on Tissue Cells. (Communicated by W. B. Hardy.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Feb. 19th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for election to the Fellowship. (Names already circulated.)

PATHOLOGY: at 8.30 P.M.
Communications:
Dr. Marshall Findlay: Experimental Biliary Cirrhosis produced by Salts of Manganese.
Dr. S. C. Dyke: Some Observations on Aleukia.
Mr. A. H. Drew: Growth-promoting Substances and Embryonic and Tumour Extracts.

Wednesday, Feb. 20th.

HISTORY OF MEDICINE: at 5 P.M.
Papers:
Mr. J. E. H. Roberts: The History of Trusses.
Dr. Charles Singer: A Chinese Coroner's Handbook of the Thirteenth Century.

Thursday, Feb. 21st.

DERMATOLOGY: at 5 P.M. (Cases at 4 P.M.)
Cases:
Dr. Ernest Dore: (1) Case of Darier's Disease; (2) Case of ? Darier's Disease (previously shown).
Dr. G. B. Dowling (introduced by Dr. Barber): A Rare Lingual Condition.
Other cases will be shown.

Friday, Feb. 22nd.

STUDY OF DISEASE IN CHILDREN: at Guy's Hospital, at 4.30 P.M.
Cases will be shown.

EPIDEMIOLOGY AND STATE MEDICINE: at 8 P.M.
Paper:
Lieut.-Colonel A. J. Williams, R.A.V.C.: Analogies between Influenza in Man and Influenza in Horses.
A limited number of copies of the paper are available. Apply to Dr. R. Dudfield, Town Hall, Paddington, W.

COMPARATIVE MEDICINE.
Members of this Section are cordially invited to attend the above meeting.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Feb. 18th.—9 P.M., Dr. R. A. Young: (First Lettsomian Lecture) Treatment of Pulmonary Tuberculosis.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, W.
THURSDAY, Feb. 21st.—8.15 P.M., Meeting preceded by a Demonstration, by Prof. F. K. Kleine of Various Trypanosomes at 7.45. The paper will be read by Prof. Kleine on his Recent Expedition to Africa to investigate the action of "Bayer 205."

THE MEDICO-LEGAL SOCIETY, 11, Chandos-street, W.
TUESDAY, Feb. 19th.—8.30 P.M., Dr. S. Henning Belfrage will open a discussion on the Law of Nullity of Marriage, to be followed by Mr. H. W. Barnard, Barrister-at-Law.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, W.
FRIDAY, Feb. 22nd.—9 P.M., Prof. G. Elliot Smith: The Human Brain.

SOCIETY FOR CONSTRUCTIVE BIRTH CONTROL AND RACIAL PROGRESS, John-street, Adelphi, W.C.
THURSDAY, Feb. 21st.—8 P.M., at Essex Hall, Strand, Dr. Maude E. Kerslake: Why We Want Clinics.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
MONDAY, Feb. 18th.—5 P.M., Mr. C. P. G. Wakeley: Some Actions of Radiations on Living Tissues.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W. 1.
MONDAY, Feb. 18th, to SATURDAY, Feb. 23rd.—Combined Course on Diseases of Children. Clinical Demonstrations and Lectures from 10 A.M. to 4.30 P.M. daily, including the ROYAL WATERLOO HOSPITAL, VICTORIA HOSPITAL FOR CHILDREN, and PADDINGTON GREEN CHILDREN'S HOSPITAL.—CENTRAL LONDON OPHTHALMIC HOSPITAL. Clinical Lecture Demonstration every afternoon. Mon., 2 P.M., Mr. Oliver. Tues., 2.30 P.M., Mr. Gibb. Wed., 2.30 P.M., Mr. Neame. Thurs., 2.30 P.M., Mr. Cunningham. Fri., Mr. Williamson-Noble (Pathological).—LONDON LOCK HOSPITAL. Clinical work daily. Lectures at Dean-street as follows: Tues., 2.30 P.M., Mr. McDonagh: Clinical Demonstration with Exhibition of Paintings. Thurs., 2.30 P.M., Mr. Corbett: Interpretations of the Wassermann Reaction. 4.30 P.M., Mr. Abel: Some Complications of Gonorrhœa in the Male. Fri., 4 P.M., Mr. Abraham: Gonorrhœal Rheumatism.—LONDON SCHOOL OF TROPICAL MEDICINE. Tues., and Thurs., 2 P.M., Special clinical Demonstrations.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Feb. 18th.—10 A.M., Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Bishop Harman: Eye Dept. 2.30 P.M., Dr. Saunders: Medical Wards.
TUESDAY.—11 A.M., Dr. McDougal: Electrical Dept. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
WEDNESDAY.—12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 12 noon: Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 10.30 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

ST. MARY'S HOSPITAL, Paddington, W.
THURSDAY, Feb. 21st.—5 P.M., Prof. B. J. Collingwood: First of four lectures on Blood.

ST. THOMAS'S HOSPITAL, Albert Embankment, S.W.
(In the Governors' Hall.)
THURSDAY, Feb. 21st.—5 P.M., Dr. J. A. Murray: Cancer. (First of four weekly lectures.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Feb. 21st.—4 P.M., Mr. Pitts: Oral Sepsis.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, Feb. 20th.—4.30 P.M., Dr. R. Knox: Recent Developments in Radiotherapy.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEBRUARY–MARCH, 1924.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, Feb. 18th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Epilepsy and Allied Conditions: Dr. James Taylor.
TUESDAY, Feb. 19th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Headaches: Dr. Risien Russell.
THURSDAY, Feb. 21st.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Poliomyelitis: Dr. Gordon Holmes.
FRIDAY, Feb. 22nd.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Surgery of Spinal Cord: Mr. Sargent.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, Feb. 18th.—12 noon, Neurosyphilis, III.: Dr. J. G. Greenfield.
The fee for the Course, including Pathology, is £5 5s. For those who hold Perpetual Tickets the fee is £3 3s.

COURSE OF LECTURES ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.
WEDNESDAY, Feb. 20th.—12 noon, Spinal Cord. Reflex Arcs. Automatism.
THURSDAY, Feb. 21st.—12 noon, Medulla and Pons: Dr. Kinnier Wilson.
The fee for this Course will be £2 2s.
Dr. F. M. R. Walshe will give A COURSE OF EIGHT CLINICAL DEMONSTRATIONS, CHIEFLY ON METHODS OF EXAMINATION OF THE NERVOUS SYSTEM, in the Wards at 10 A.M., every Wednesday and Thursday during February. The numbers attending the Course will be limited. Fee £2 2s.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, Feb. 20th.—3.30 P.M., Optic Atrophy: Mr. Leslie Paton.
The fee for this Course alone is £5 5s. If taken in conjunction with the general Post-Graduate Course the fee is £3 3s. All applications should be sent to the Secretary, Medical School.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the Office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Feb. 21st.—5 P.M., Mr. C. White: Delay in the Second Stage of Labour.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Feb. 19th.—5 P.M., Dr. Haldin Davis: Ulcers of the Leg.
THURSDAY.—5 P.M., Dr. Griffith: Pustular Dermatoses.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Feb. 18th.—(At the Hospital for Women.) Dr. J. E. Gemmell: Pelvic Infection.
TUESDAY.—(At the Maternity Hospital.) Dr. Hendry: Some Points in Ante-natal Work.
WEDNESDAY.—(At the St. Paul's Eye Hospital.) Mr. Hayward-Bywater and Mr. Plummer: Pathological Conditions of the Lens.
THURSDAY.—(At the St. George's Skin Hospital.) Dr. Frank H. Barendt: Skin Cases.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES.
TUESDAY, Feb. 19th.—(At the Jessop Hospital.) 3.30 P.M., Prof. Phillips: Diagnosis and Treatment of Discharges.
FRIDAY.—(At the Royal Hospital.) 3.30 P.M., Dr. Skinner: Clinical Value of the Wassermann Reaction.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURES (at Whitworth-street West Branch).
FRIDAY, Feb. 22nd.—4.30 P.M., Dr. D. Dougal: Analysis of the Monthly Maternity Report and Remarks on the Treatment of Some of the More Important Obstetric Emergencies.

ANCOATS HOSPITAL LECTURES.
THURSDAY, Feb. 21st.—4.30 P.M., Dr. A. H. Holmes: Late Cardiac Complications of Rheumatism.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES.
THURSDAY, Feb. 21st.—4.30 P.M., Mr. R. R. Kerr: Diagnosis and Treatment of Chronic Abdominal Troubles.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
MONDAY, Feb. 18th.—4.15 P.M., Mr. S. R. Wilson: Recent Improvements in Anæsthesia.
TUESDAY.—4.15 P.M., Mr. E. D. Telford: Lateral Curvature of the Spine in Children.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Feb. 20th.—4 P.M., Dr. M. S. Paterson: Infectivity of Tuberculosis.

Appointments.

UTCHER, W. H., M.D., D.P.H. Oxf., has been appointed Assistant Medical Officer, Somerset County Council.

RNISS, ADA, M.R.C.S., L.R.C.P. Lond., D.P.H. Vict., House Surgeon, Nottingham Children's Hospital.

WIS, E. CATHERINE, M.S. Lond., F.R.C.S. Eng., Urologist to the South London Hospital for Women.

rtifying Surgeons under the Factory and Workshop Acts: MACKENNA, L. (Oakengates, Salop); IVES, B. G. (Newark); HETHERINGTON, G. M., M.B., Ch.B. Glasg. (Clackmannan).

Vacancies.

For further information refer to the advertisement columns.

berdeen Royal Hospital for Sick Children.—Hon. Asst. S.
irmingham General Hospital.—Director of V.D. Dept. £600.
irmingham, Highbury, Uffculme and Sorrento Hospitals.—Med. Supt. £800.
irmingham, Queen's Hospital.—Med. Reg. £100.
righton, New Sussex Hospital, Windlesham-road.—H.S. £50.
ristol, Cossham Memorial Hospital, Kingswood.—H.S. £150.
ristol General Hospital.—Two H.P.'s, H.S., Res. Obstet. O., and Cas. H.S. Each £125.
rlisle, Cumberland Infirmary.—Res. M.O. £175.
dinburgh Royal Mental Hospital.—Asst. P. £350.
velina Hospital for Children, Southwark, S.E.—P. to Out-patients.
amorgan County Mental Hospital, Bridgend.—Jun. A.M.O. £350.
ull Royal Infirmary.—Asst. H.S. £150.
ensington, Fulham and Chelsea General Hospital, Richmond-road, S.W.—Reg. 20 guineas.
ent County Ophthalmic Hospital, Maidstone.—H.S. £300.
verpool, Alder Hey Hospital for Sick Children.—Res. Asst. M.O.'s. £200.
verpool, Mill-road and Brownlow-hill Infirmaries.—Asst. Res. M.O. £200.
alay States.—M.O.'s, and Health O.'s. £616.
anchester, Ancoats Hospital.—H.S. £100.
anchester Corporation.—Asst. Tub. O. £621.
anchester, St. Mary's Hospitals.—Res. Obstet. S. Res. S.O. Each £200. Also two H.S.'s. Each £50.
etropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—Asst. S.
orwood and District Cottage Hospital, Hermitage-road, S.E.—Vacancy on Hon. Med. Staff.
ortsmouth Royal Hospital.—Sen. H.S. £200. Also Asst. H.S. £150.
ortsmouth Workhouse Infirmary.—Asst. R.M.O. £350.
oyal Chest Hospital, City-road, E.C.—P. to Out-patients.
oyal Earlswood Institution, Redhill, Surrey.—Jun. Asst. M.O. £250.
oyal Northern Hospital, Holloway, N.—H.S. £75.
t. Mark's Hospital for Cancer, Fistula, &c., City-road, E.C.—H.S. £200.
t. Pancras Dispensary, 39, Oakley-square, N.W.—Hon. Ophth. S.
t. Thomas's Hospital.—P. Also Ophth. S.
arborough Hospital and Dispensary.—H.S. £150.
otland General Nursing Council.—Examiners.
heffield Royal Hospital.—Surg. Reg. £200.
outhampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.
outh London Hospital for Women, South Side, Clapham Common, S.W.—Three H.S.'s and one H.P. Each £50.
est London Hospital, Hammersmith-road, W.—Hon. Med. Reg., Hon. Surg. Reg., and Hon. Obstet. Reg.

he Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Sherston, Wilts; Bodmin, Cornwall; Thornhill, Dumfries.

Births, Marriages, and Deaths.

BIRTHS.

AITHNESS.—On Feb. 6th, the wife of Dr. William Caithness, of George-street, Manchester-square, W., of a son.

HEELER.—On Feb. 4th, at North-street, Rugby, the wife of Dr. J. N. Wheeler, of a daughter.

DEATHS.

URTIS.—On Feb. 8th, at Alton, Hants, William Curtis, M.R.C.S., L.S.A., aged 87.

EWTON.—On Feb. 6th, John Newton, M.R.C.S., L.R.C.P., aged 72.

NELL.—On Feb. 5th, at Cecil-court, London, S.W., George Snell, M.D., late Colonial Medical Service.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

A "GRADED FACTORY" FOR TUBERCULOUS PATIENTS AND EX-PATIENTS.

BY C. F. PEDLEY, M.R.C.S. ENG.,
SENIOR RESIDENT MEDICAL OFFICER, WINSLEY SANATORIUM, NEAR BATH.

A SANATORIUM officer is interested in any views of working process on the care and after-care treatment of tuberculosis. In a paper on this subject read by Dr. F. J. H. Coutts at the ninth annual conference of the National Association for the Prevention of Tuberculosis, held at Birmingham in July, 1923, the point most emphasised was that the family of a tuberculosis patient must be taken as the unit in all schemes for care and after-care treatment.

Establishment of Diagnosis.

Probably many hundreds of patients pass through the hands of a sanatorium officer during his term of office, and where the institution is one for pulmonary tuberculosis he will of necessity have to deal with other forms of tuberculosis. In every instance he will have to consider the future of each patient, not only with reference to the individual's health, but also with regard to that individual's niche in the community outside an institution. As all sanatorium officers will acknowledge, all cases which pass through sanatoria are not suffering from tuberculosis, but 90 per cent. of these cases are probably labelled and notified as tuberculosis and are therefore handicapped for life.

In the present state of knowledge—among the general population and, I regret to think, among some members of the medical profession—tuberculosis is looked upon as a fell disease; in the latter case so much so that a patient with a positive sputum and in need of surgical treatment for some other cause is refused treatment in the general wards of a hospital. It is of the utmost importance that a difference should be recognised by everyone between a patient who has received sanatorium treatment for a condition not clearly distinguished and one who has received such treatment because he is suffering from tuberculosis. In many cases it is impossible to diagnose pulmonary tuberculosis at a dispensary or in a home: a patient suspected of pulmonary tuberculosis should be under observation for a length of time before a label is attached to his condition, and this can usually only be done in an institution.

A sanatorium should therefore be used much more frequently than it now is for purposes of diagnosis as well as for treatment of proved cases of tuberculosis: such use is allowed under the Ministry of Health's heading "Cases under Observation." Certificate "A" would not, therefore, be issued, as it so often is at present for every case because the patient is sent to a sanatorium. It makes a great difference to a patient who enters a sanatorium knowing that his case is only under observation, and that he may be passed out as not suffering from tuberculosis.

Definitely Tuberculous Patients.

We thus come to those patients who are definitely suffering with tuberculosis and these alone are the object of care and after-care treatment. To-day a tuberculosis patient after treatment is almost entirely maintained by charity, whether in a colony, on the staff of an institution, or in his home. His outlook is the same for the rest of his life, and there is no incentive to better his position. His labour tends to be exploited, his home goes to pieces, he may have lost his self-reliance, independence, hope; give these back to him and he is a new-made man. The treatment apparently most prevalent in sanatoria throughout this and other countries is the "graded work" system based on the theory of auto-inoculation. It is accepted by most tuberculosis authorities that by this method a person's resistance to active disease can be raised to and maintained at such a level that the individual can live and work for years if his outside circumstances allow it. The goal of all schemes for care and after-care treatment is to make these circumstances favourable, and I wish in this paper to lay the foundation of a plan to overcome the difficulties which surround the life of an ex-tuberculosis patient.

One gathers from Dr. Coutts's paper that much money is devoted by various bodies to the social and individual amelioration of the lives of tuberculosis patients outside an institution, and hardly any one scheme is similar to another. Every patient, whether he has been in a sanatorium or not, is, at the end of his treatment, in one of three classes: (1) fit for work, (2) fit for some work, (3) not fit for work. But a definite tuberculosis patient in Class 1, however fit he is, is never a 100 per cent. man in the world's market. Therefore he, together with his immediate circle, is affected from a social and economic point of view. Much more so

are the greater number of patients who fall in Class 2. I exclude from consideration those patients not fit for any work, as presumably they have "active" disease and still require institutional or hospital treatment. Sanatoria are maintained mostly by State and rate finance, and are usually the centre of the active anti-tuberculosis work in their district, with their patients living somewhere reasonably near.

The Graded Factory.

I would suggest that in an area where a sanatorium has been deemed necessary a "graded factory" should be erected. From a census of the occupations followed by all types of patients on the tuberculosis roll in this area can be formed a very definite idea of the products to be expected from such a factory. All ex-tuberculosis patients are worth a certain percentage in the market; under favourable circumstances every patient can raise his percentage value, as he can on graded work in a sanatorium, after the system laid down by Marcus Paterson. I consider it injurious and unnecessary in the majority of cases that a patient undergoing treatment should give up his occupation and, as usually happens nowadays, be taught a new trade. It is impossible to expect a man of, say, 40 to keep himself let alone a family also. Exceptionally few occupations per se cause tuberculosis: it is always the circumstances which are adverse and cause all the trouble. In my scheme, therefore, an ex-patient would continue his occupation in this factory according to his grade capacity.

The factory, its machinery, shops, and grounds would, of necessity, have to be as hygienic as the dwellings in a colony or sanatorium. As regards percentage of normal work, say an ex-patient bricklayer can do a grade of work worth 40 per cent. of the normal amount. There may be other ex-patient bricklayers, some at 30 per cent., some at 90 per cent.; the percentages can be worked in with one another, so that a 100 per cent. time sheet, and in effect a 100 per cent. value sheet is finally obtained in bricklayers' work in that factory.

It must be fully realised that working under favourable conditions an ex-patient may be worth and able to perform the real 100 per cent., in which case he would receive full market wages. The sole charity which this man accepts is the fact that he is recognised by the community as a "lame dog" in the open market only. His incentive to work is that of a normal man—wage-earning and all that appertains thereto—and he works the better knowing that health is for him the only way to economic independence. The 40 per cent. man can, at least, raise his standard of health and his economic value. In my scheme, while his value is low, he receives material charity to the extent of the difference, in this case 60 per cent.; what is not found for him is the means to escape this 60 per cent. charity and dependence, and to earn his 40 per cent. It is this difference which exists between any present-day scheme in care and after-care treatment and the proposal which I am putting forward, and which I desire to stress. An ex-patient, in my scheme, on entering a graded factory is made a useful and self-supporting member of the community, and set on the road to self-reliance, hope, and independence.

Staffing and Supervision.

In charge of this factory would be (1) a business manager, and (2) a physician well versed in the theory and practice of auto-inoculation—the combination working like a captain and his medical officer in a ship. The ex-patient should be graded by the medical officer, and the manager should set him to work in the correct grade, his time and pay-sheet being allotted accordingly. The manager would make up the quota of work in the factory by interlocking the various percentages. The medical officer would adjudicate the grades by temperature chart and periodical examinations. I would propose that each patient should keep a chart and record his own morning and evening temperature, and that on arrival at and departure from the factory his temperature should also be recorded. Fortnightly or at longer intervals his grade should be raised. If an auto-inoculation or breakdown occur the ex-patient would become an in-patient in his former institution or at home, and, as at present, receive sickness benefit—only instead of having a precarious inducement to leave the institution he would have a very real one—re-admission into the graded factory.

An important point in the scheme is that this factory is central, and therefore work-travel, a serious obstacle in the life of many ex-tuberculosis patients, is practically eliminated. It seems to be the modern tendency of good manufactory houses to have sufficient space around their factory for the recreation of their employees and for the employees to reside in the neighbourhood of parks. Thus an ex-patient also will have a home life and a working life, whatever his occupation, like an ordinary citizen.

By what means can this graded factory be raised and maintained? How have various colonies and sanatoria throughout the country been established? Cannot they one and all come from the same source? Some sanatoria are self-supporting and even make a profit. I do not know any colony that does.

Economic Aspect.

Once established, I consider that this graded factory could be run on a sound economic basis, the products would be on the open market at current prices, and the community would know that there was no exploitation of labour, but would realise, as in institutions for the blind, each ex-patient workman was giving his full percentage worth. The more the ex-patient flourished as a workman, the less would be the calls on charity. Such a scheme embodies a definite and workable plan of management. A graded factory can be maintained by any governing body such as controls our sanatoria, and attains the object of all schemes for care and after-care treatment in tuberculosis—viz., the assurance of work and wages for men, women, and children alike, and the opportunity of maintaining self-respect, self-reliance, and independence. The work of the tuberculosis dispensary would still be of the utmost importance as a clearing house for discharged sanatorium patients. The tuberculosis officer might draft the patient with his sanatorium grade into the graded factory, without loss of time, and the patient, spared the trials of unemployment, would thus be able to work at his own particular trade under sanatorium conditions.

It is obvious that the financial aspect of this scheme will have to be investigated with care by experts, but I am fully convinced that the expenses would not equal a tenth of those involved by a "colony." From the medical and public health point of view I feel assured that the graded factory would supplement the valuable work in the prevention and treatment of tuberculosis done by the sanatoria, the result of which is at present often lost. The ex-patient and his family will gain new hope, and therefore a renewed interest in life.

Note.—I am interested to read in Dr. A. S. MacNalty's article "Tuberculosis Work in England," in THE LANCET, Jan. 26th, a suggestion that there is or will be in Leeds a scheme in care and after-care treatment on some such lines as I have proposed.

PUBLIC HEALTH IN THE CAMEROONS.*

ACCORDING to a report bearing the signature of Lieut.-Colonel H. C. Moorhouse, Lieut.-Governor of the Southern Provinces of Nigeria, based mainly on material supplied by the resident (Major F. H. Ruxton), the Cameroons Province is at present divided into four medical areas, which correspond roughly with the natural features of the country: (1) The sea coast of Victoria and the plantations in the neighbourhood; (2) the hill station of Buea with Kumba; (3) the river plain of the Cross River (Mamfe Division); and (4) the table land area of Bamenda. Medical officers are stationed when available at Bamenda, Mamfe, Buea, and Victoria, with a native dispenser at each station. Each of these areas has its localised diseases and sanitary problems. These are but slightly affected by the ex-German hospital and sanitary arrangements, as the areas which have to be served by the stations are very extensive and the people not advanced in questions of public health. The natural advantages of the country in being for the most part of a mountainous nature with a relatively low temperature and good natural drainage and water-supply counteract many of the evils which would otherwise flourish. In the forest area the soil is mainly clay and natural drainage poor; there is no attempt among the natives to instal any system of soil disposal other than shallow pits scratched in the jungle close to the village, and with no regard to the source of drinking water, which is generally the nearest stream. It is understood that the "street-system" of villages throughout this area was the invention of the Germans for political reasons. A description of a typical village may be of service: A wide road, beaten flat by constant traffic, along which the town extends on either side with as few breaks as possible, to avoid separate walls and roofs in construction of the houses; the length of this street is limited only by the number of inhabitants, and forms a tunnel along which ventilation is only possible in the line of the street; the houses, low and dark, built flimsily of wattle and daub, with poorly thatched roofs,

* The German Protectorate of Kamerun on the west coast of Africa between British Nigeria and French Congo was obtained by conquest by Franco-British forces during the war of 1914–18, and at the conclusion of peace its administration was confided by the Supreme Council of the Allied Powers to Britain and France jointly. The British sphere is a wedge-shaped strip, running with the Nigerian border, and containing an area of about 28,000 square miles. It is administered by the Nigerian Government.

lighted and ventilated as a rule only by a low door at front and back; no shade along the road, which may run for three miles through a village of this type; no trenching in front of or behind the houses and clearing of bush behind, so that all refuse and night soil is deposited a few yards from the dwelling. Cultivation, is as a rule, some distance from the village, so that the latter does not obtain the benefit of cleared and clean ground around it. Throughout the area a common source of income appears to be pig-breeding, these animals being neither fed nor penned, and drawing their food from jungle weeds and village garbage, with free access to either. The staple food of the people is the bulb of the "coco-yam" arum lily, which is a bulky and perishable article of small nutritive value. It is, however, fairly easy of cultivation, though there appear to be large areas where the true yam as well as maize could be grown. Around the food question revolves the vital and vicious circle of infant mortality. This depends on the well-being of the expectant mother, whose status appears to be low in the Cameroons, where all the manual labour of the farm and the house falls to her share. The people themselves are most anxious to seek treatment for their children, who come to the local dispensary in large numbers for medicine, and every case serves as a text for impressing the value of simple measures in feeding and cleanliness, which the parents appreciate. On the other hand, the great majority of the people appear to be chronically underfed and the women overworked while young and neglected when old. The staple diet is inadequate for young children and the sick, who fall an easy prey to such complaints as ulcer, skin diseases, and intestinal parasites. In Bamenda the country possesses great assets in being well drained, with a temperate climate, and in possessing good food supplies. Large quantities of potatoes, introduced by the Germans, are grown by the natives for their own consumption. The water-supply is abundant, and fairly free from contamination, being from mountain streams. The general type of native is sturdy and markedly free from the chronic ailments that are seen in the forest area drained by the Cross River. The system of plantations around Victoria has hitherto employed large numbers of natives (11,000 in August, 1922). These men and boys receive free medical treatment in hospitals, of which there is one on every plantation, with native dressers and attendants under the supervision of the medical officer. There have been no widespread epidemics, and there is a remarkable absence of diseases attributable to the nature of the work. Serious cases can be transferred to hospitals at Buea or Victoria directly under the supervision of the medical officer. Throughout the Cameroons the people have willingly submitted to vaccination and to medical instructions regarding isolation and treatment of infectious cases. Acute cases of bronchial pneumonia occur at the "change of season" from the dry to the wet, and vice versa; the natives attribute this to the effect of the influenza epidemic of 1918. It is probable that the infection of that epidemic will linger for some time, especially in the areas of overcrowding and heaviest rainfall. It is hoped to establish small dressing stations, of the nature of "aid posts," under the direction of the medical officers and staffed by natives sufficiently trained to use simple remedies, who will advise the local inhabitants in sanitary measures. With improved communications it will assuredly be found that not only will the people be able to seek medical advice more freely, but that the freer exchange of commodities will raise the standard of living and increase the food-supply, with the improvement of the health of children. The fact that the birth-rate is low does not appear to be due to venereal disease, few cases of which are seen except in the stations, where they appear to be imported, and do not go with a system of professional prostitution. Promiscuous relations seem generally due to the inability of the man to pay the dower asked for a girl, who may therefore decide to live with her "friend" for a period, depending on his whim or means. As such union gives her no claim on the children, the discarded woman has to find another refuge, having no independent means. The practice of holding the children of a marriage in bond to the woman's parent until the whole dower is paid has also an adverse effect on the increase of families, and as the man in a position to afford several wives is usually elderly there are few children in proportion born to him, with the added disadvantage that the offspring of the young and healthy women of a village may be nearly related by blood. Throughout the Cameroons the natives avail themselves willingly of medical advice and treatment, and appreciate the superiority of European methods to their own, though, as elsewhere, they often delay coming to hospital until their own methods have proved unavailing, and are disappointed that the white man's cure is not more swift and spectacular. For this reason the majority of patients who are willing to undergo prolonged treatment in Government hospitals are surgical rather than medical cases.

FOOD POISONING AMONG ANIMALS.

DOMESTIC animals seem less able to discriminate between good and harmful diet than do wild animals. When the farmyard stock is out at pasture, and particularly in the spring after the long winter months of dry fodder, the succulent green of the meadows overcomes old instincts, and poisonous vegetation is consumed undetected. In this way, such toxic substances as ragwort, horse-tail, yew, laurel, and laburnum are often eaten. Poisoning among animals is dealt with at length in the January and February issues of *Veterinary Journal*. The ingestion of poisons may be accidental, through ignorant administration of dangerous drugs, or through the animal consuming some so-called harmless rat-poison. Poison may be present as an adulterant of certain prepared foodstuffs, or may be due to vegetable, animal, or mineral contamination of the drinking water.

Many sick animals are treated by their owners with overdoses of potent medicaments or with quack preparations of a harmful nature, and G. W. Clough, D.Sc., of the Royal Veterinary College, London, cites some interesting cases of fatalities in sheep, goats, pigs, and dogs from the use of proprietary medicines which contained poisonous drugs in over large proportions. As examples of food adulterants which not infrequently cause death, mention is made of excessive amounts of salt in fresh meat, castor beans in cake, and barium carbonate in sharps. In parts of the country situated near lead-mining districts deaths frequently occur in horses, cattle, sheep, dogs, cats, and poultry from lead poisoning, and many accounts of cases and the post-mortem symptoms are given. The streams that run away from lead mines over the surrounding country are especially dangerous for watering stock. Malicious poisoning forms another category. Students of toxicology will find much that is interesting and instructive in these two issues of *Veterinary Journal*. The cases of poisoning that veterinary surgeons meet with are numerous and varied, and the experiences recorded are worth reading by those who take more than a passing interest in the subject.

THE HYGIENE OF THE COMMUNION CUP.

WE have received a pamphlet bearing the above title, written by Dr. W. H. Read, and published in Sydney by the *Christian World*. The pamphlet deals with two questions: Is there danger of infection from the use of a common cup at the administration of the Holy Communion? and Should each several communicant have his own private cup? We have dealt with these problems from the medical point of view upon several previous occasions [1] and we can but repeat our opinion. The use of the common cup may transmit disease, although the risk is but slight except in places where a number of obviously tuberculous communicants are present. The only methods of avoiding such risk are: (1) the communicating the laity in only one kind; (2) the use of the form of communication known as intinction; and (3) the use of individual cups. Of these three methods (1) is allowed by the Roman Church, which employs it, to be contrary to primitive practice; (2) is objected to by one school of thought as being contrary to the command "Drink ye all of this"; and (3) is objectionable to our mind on account of the difficulty of providing for the proper cleansing of the cups. Despite the opinion of the Rev. F. W. Reeve, who writes on p. 28 of the pamphlet that "the only objections met with are from extreme ritualists, who would be unable to perform certain oblations (sic) quite unauthorised by the Prayer-book," we can assure him that the question of proper cleansing (for we imagine that the reverend gentleman means "ablutions" when he writes of "oblations") is a serious matter to many others than extreme ritualists. Intinction therefore seems to us the best way out of the difficulty. It is primitive, it is decent, and reverent, and we would commend to the notice of those who object that the method minimises the command "drink" the following point, namely, that the two Evangelists, St. Matthew and St. Mark, in their account of the crucifixion, when describing the giving of the sponge dipped in sour wine to Christ on the cross, both use the word ἐπότιζεν—i.e., "gave him to drink."

THE TEMPERANCE REFORMER'S HANDBOOK.

IN the Alliance Year Book and Temperance Reformer's Handbook for 1924 (London: U.K. Alliance and Headley Brothers, pp. 269, 2*s*.), many aspects of the problem of alcohol are considered from the point of view of those who, in their own words, "were satisfied that the history and results of past dealing with the liquor traffic in all lands had abundantly proved that it was impossible satisfactorily to limit or regulate a system so *essentially mischievous*." A foreword contains a brief account of the United Kingdom Alliance and of its activities—which, as is well known, are political rather than religious—from the foundation of the organisation in 1853 to the present day. Messrs. B. S.

[1] THE LANCET, 1900, ii., 1088 and 1364; 1903, i., 1186; and 909, i., 1698.

Spence and H. A. Job contribute articles on the temperance position in Canada and Australasia respectively. Sir Auckland Geddes's memorandum on American Prohibition is very interesting, not least because he has tabulated side by side the statistical conclusions relating to the effect of the Volstead Act (passed in October, 1919) from three sources: (1) the Anti-Saloon League, (2) the Association against the Prohibition Amendment, and (3) the Federal Prohibition Unit of the United States Treasury. The enormous discrepancies in these comparative figures explain the confused echoes which arise in this connexion on our side of the Atlantic. Thus the number of arrests for drunkenness on a 100 per cent. basis of the number in a given time during the period before prohibition is put at 50 by the League, at "fully 100" by the Association, and at 50 by the Treasury Unit. The figures of deaths from alcoholism, similarly compared, are given as 20, 250, and 20 per cent. respectively; and other supposedly carefully-compiled statistics show similar differences. Sir Auckland Geddes also notes that since the adoption of prohibition a large increase—computed at 40 per cent.—has taken place in the amount of deposits in savings banks; the claim that prohibition has increased production in the factories and has bettered the home conditions of the average wage-earner is, perhaps, rather lightly dismissed, with the comment that "so many other factors have contributed to restore economic conditions in the United States since the war that it is almost impossible to form any estimate of the extent to which prohibition has contributed to this recovery, or otherwise." In an article apparently reprinted from the New York *Outlook*, Mr. Raymond Spears writes of "The Furtiveness of Liquor," and makes the following statement: "I can walk the streets of my town and not see ten drunks in six months, when in half an hour before prohibition came I saw and counted thirty-odd in 15 minutes. And, with my eyes open, I drive tens of thousands of miles and see no drunken men, and the pitiful dejection or recklessness that is the mark of illicit liquor on property and community and individual appears only at long intervals, and one must know it to recognise the sign." Another interesting feature of the Year Book is a series of "pictorial studies in temperance economics," or posters issued by the Alliance in leaflet form for propaganda purposes. The full text of the Intoxicating Liquor (Sale to Persons under Eighteen) Act, 1923, is also included. The usual full index facilitates reference.

A USEFUL HYPODERMIC OUTFIT.

Dr. John W. Tomb, medical officer of health, Asansol Mines Board of Health, Bengal, sends us the following description of a useful and compact hypodermic outfit which he has used in India for over ten years under all conditions of transport. He writes: "The universal use of hypodermic medication necessitates the possession of an outfit which will secure the minimum waste of time in its employment with the maximum of surgical sterility. The hypodermic outfits sold by the large manufacturing houses are costly and require very considerable care in transport. I claim for the outfit here described that it is cheap and always ready for use. It consists primarily of a three-piece 60-minim B. & W.'s all glass hypodermic syringe, with a platino-iridium needle, size No. 27. The syringe when originally assembled is sterilised by boiling in its metal case and is *never afterwards taken apart*. The platino-iridium needle is also originally sterilised by boiling but on all subsequent occasions is sterilised by heating in the flame immediately before and after use. As an additional security against contamination, and to preserve the point against injury, the needle is kept in an empty sterilised hypodermic tabloid glass phial of suitable size with the point of the needle directed upwards and embedded in the cork, a pledget of sterilised cotton-wool being placed at the bottom of the phial. The "lamp" consists of an ordinary 2 oz. glass-stoppered narrow-necked bottle filled with methylated spirit and provided with a separate (locally made) brass or other "burner" with a wick of twisted cotton strands. To wash out the syringe after use and at the same time to sterilise it and to maintain it constantly in sterilised condition, and also to prevent the glass piston from sticking to the barrel, a mixture of equal parts of glycerine, carbolic acid, and rectified spirit is provided in a ½ oz. glass-stoppered bottle. The needle having been previously sterilised in the flame, five to six minims of this mixture are drawn into the barrel of the syringe on each occasion after use. The piston is then gradually withdrawn while holding the nozzle of the syringe upwards, so as to allow the mixture to escape and at the same time thoroughly to wash it out and lubricate the whole barrel, the piston being subsequently replaced. A small teaspoon is included in the outfit in which to dissolve the hypodermic tablets by boiling, and thus secure that none but sterilised solutions shall at any time be taken into the barrel of the syringe. In the tropics it is often desirable to assist the cooling of the sterilised hypodermic solutions by immersing the tea-spoon to half its depth in a little cold water in a saucer or other suitable vessel. Not more than 60 seconds are required for this operation.

The whole outfit is contained in a stout cardboard box 7½" long by 4" broad by 2½" deep, with a cover of the same material. The box is half filled with cotton-wool to absorb shocks and to protect the contents from injury. As an additional protection a layer of corrugated cardboard is also fitted around the inside of the box on all sides, and a the top."

THE GLASGOW ROYAL INFIRMARY.

AT the annual general Court of Contributors of the Glasgow Royal Infirmary, held on Feb. 11th, the report by the managers for 1923 was submitted. The work of the infirmary has increased considerably during the past year. Beginning the year with 653 in-patients, the total treated in the wards during the 12 months numbered 12,759, being an increase of 1397 on the previous year. There were on occasion no fewer than 789 patients in the house at one time, the daily average number resident being 722·9, and the average period of residence 20·7 days. In view of the large numbers waiting admission, some overcrowding was unavoidable. The number remaining on Dec. 31st was 672. Similarly an increased volume of work was carried on in the out-patient department, where 48,693 patients, being 4004 in excess of the number in 1922, attended for advice and treatment, while the total number of attendances was 220,193, as compared with 188,532. At the ophthalmic institution 855 in-patients and 13,541 out-patients were treated. At the Schaw Home, Bearsden, 1041 persons were received as convalescent patients. One outstanding feature has been the introduction to the infirmary of the treatment of diabetes by insulin. Since February last diabetes has been treated with insulin at the infirmary with satisfactory results, but the investigations are not complete, and are being continued. The Royal Infirmary has not a bio-chemical laboratory, and special arrangements were made to supply the need, but with the help of some friends the necessary funds were raised so that the infirmary funds were not called upon to defray any of the expenses of this investigation. As soon, however, as the experimental stage was past, the managers decided that the cost of insulin should be borne by the infirmary. The managers apprehend that another addition to expenses must soon be made by establishing a bio-chemical department, to aid not only in the actual treatment of the patients, but also in the investigation of those diseases which are due to faulty metabolism. In view of the widespread stagnation of trade and increased difficulties due to unemployment and other causes, it is matter for congratulation, the report states, that the financial year terminated satisfactorily. The total amount received from all sources exceeded the sum for the previous year. On the other hand, expenditure rather increased. To equip the infirmary adequately to meet modern demands and developments in all departments of medicine and surgery, a large fresh expenditure will also be necessary. Subscriptions from employees and others were generous, though slightly less than in the previous year. The widening of the scheme for organised weekly contributions in works, warehouses, &c., continues to bring in new and increased subscriptions. The ordinary expenditure of £107,686 was £2873 more than in the previous year, and the ordinary revenue amounted to the sum of £82,976—a deficiency of £24,710. There were received during the year the sums of £21,224 in legacies, and £11,200 by way of donations. These sums were drawn upon for extraordinary expenditure of £1301 and to meet the above deficiency of £24,710 on ordinary revenue account. In the final result there is a surplus of £6113.

One Who Believes, &c.—A letter has been received on the subject of an Osteopathic Directory, which can only be inserted if the author entrusts us with his or her name and address.

Lettsomian Lectures

[ABRIDGED]

ON THE

TREATMENT OF PULMONARY TUBERCULOSIS.

Delivered before the Medical Society of London

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LECTURE I.

(*Delivered on Feb. 18th.*)

THE scourge of tuberculosis has probably been coeval with civilisation, if indeed it does not date from the time when man became gregarious or from that period when he first made an enclosed habitation for himself. In this connexion it is of interest to note that although tuberculosis occurs in many mammals and in some birds, it is rare, if not unknown, in their wild state, and only becomes apparent when they live in association with man, or under conditions of confinement in stalls and zoological gardens. Anthropoids do not contract it in the wild condition, but are extremely susceptible in captivity. These facts are significant in connexion with the incidence of the human disease. Oxen, pigs, the dog, and to a less extent the cat, suffer from this disease, while the horse, sheep, and goat are more refractory. At the same time most mammals are susceptible to inoculation, and even the most refractory seem only to have the power to inhibit the activity of the bacillus, not to destroy it.

The form of acid-fast bacillus occurring in fish, amphibians, and batrachians is probably an entirely different organism. It is only of interest in regard to that from the attempt made by Friedman to utilise it in the treatment of the human disease. The problem of the rôle of the bovine bacillus in producing pathogenic effects in human beings need not be considered at length in regard to the subject I have chosen, since only in children does it seem to have any real incidence, and then its stress falls upon the glands, bones, joints, peritoneum, and meninges. In pulmonary tuberculosis, as seen in the adult and the adolescent, the bacillus found is almost without exception of the human type. At the same time this question raises a pathological point of great importance which may well prove to have practical bearings in regard to treatment. This is the relationship of early bovine infection which is recovered from, to human infection later in life. There is much evidence to support the view that early bovine infection serves as a protection to later infection, except when this occurs in massive doses or under unfavourable conditions.

[The lecturer then dealt with the history of the treatment of tuberculosis from the earliest times to the present day.]

NATURE OF PULMONARY TUBERCULOSIS.

The discovery of the exciting cause of a disease is generally hailed as the harbinger of its cure, and as giving hope of securing its prevention and eradication. The history of the treatment of tuberculous disease since the discovery of the tubercle bacillus by Robert Koch in 1882 shows that such hopes may be vain, and that for effective treatment the fullest knowledge of the causative agent and of its effects may be necessary.

The list of treatments recommended for tuberculosis is an ever-lengthening one. This alone affords little encouragement, for we can, as a rule, judge the efficacy of treatment as inversely proportional to the number of remedies suggested. In this disease there is certainly no lack. They vary from absolute rest to the most strenuous exercise, from life at sea-level to high altitudes and even to balloon ascents, from hyper-alimentation to grape cures, from serum therapy to vaccines of various kinds, from inhalations to intratracheal injections, from silence to singing lessons, and from castration to thoracoplasty. We should aim at being eclectic, and thus securing for each patient that combination of management, locality, and medicinal agents likely to put him in the best condition to secure arrest and to restore him to health and working capacity.

From the prodigious literature relating to this disease, and from the welter of controversy concerning its pathology and treatment, certain generalisations emerge with almost the authority of axioms. These I may here state categorically, with a view to determining whether they afford any rational basis on which we may found our treatment, and whether there is any hope of a specific curative treatment in the future.

(1) Pulmonary tuberculosis is almost exclusively due to the human type of the tubercle bacillus.

(2) It is a disease sui generis and confined to man in its ordinary chronic form. Experimental infections of animals do not reproduce it.

(3) It is practically unknown in infancy, rare in early childhood, and becomes increasingly evident at puberty and in adult life.

(4) Under urban conditions in most countries exposure to infection by the tubercle bacillus is almost universal, either from bovine sources in milk and its derivatives, cream, butter and cheese, or from human sources by sputum or other discharges.

(5) Ninety per cent. of adults give some form or other of tuberculin reaction when tested.

(6) We must not regard the presence of tubercle bacilli within the body as evidence of tuberculous disease, and still less the occurrence of tuberculin reactions. The latter only indicate tuberculin sensitiveness due to previous tuberculinisation, either from bacilli spontaneously acquired or from previous administration of tuberculin.

(7) The converse of this is true—namely, that active progressive lung disease is consistent with a high degree of immunity to subcutaneous injection of tuberculin. This fact has been applied by dealers in the sale of pedigree cattle, and is now made a plea for the official control of the sale of tuberculin.[1]

(8) The development of pulmonary tuberculosis in a given individual indicates that the protective processes are defective, or that the infection has been gross or massive so as to swamp these processes.

(9) These protective processes vary in effectiveness in different individuals and in different races, and are never absolute.

(10) The tubercle bacillus is a very resistant organism in vivo, possibly in virtue of its lipoid rich envelope, and even the animals most refractory to its effects can usually only inhibit or prevent its activities without destroying it.

(11) In resistant individuals, both human and animal, the bacillus may live for long periods enclosed and apparently harmless while yet retaining its infectivity.

(12) In civilised races long exposed to its activities many infected persons recover spontaneously with very few symptoms, and even in ordinary chronic cases the course is often marked by periods of quiescence or regression, whereas in races not previously exposed its incidence is severe, usually acute, and rapidly fatal.

(13) Cases of pulmonary tuberculosis following on multiple tuberculous lesions elsewhere usually run a favourable course (Marfan's law).

(14) Koch's phenomenon, as briefly stated by Calmette, "Every already tuberculous body tends to expel a new dose of bacilli inoculated subcutaneously."

The explanation of these fundamental generalisations is difficult. We are each of us so inclined to interpret them in the light of our own special views as to the factors of infection, heredity, diathesis, immunity reactions, or environment. Koch's phenomenon, which I have just quoted, seems to offer the most probable explanation of the pathogenesis of pulmonary tuberculosis as it occurs in the adult. It is of interest to note that Koch himself, although he recognised the importance of his own observation, which indeed led him to the discovery of tuberculin, yet did not realise its significance in regard to the peculiar features of pulmonary tuberculosis in the adolescent and adult. Behring was the first to suggest that the primary infection in tuberculous diseases

[1] THE LANCET, Feb. 2nd, 1924, p. 247.

occurs in infancy or early childhood, and that the development of pulmonary tuberculosis might be due to the liberation of tubercle bacilli long enclosed by protective and reparative processes, owing to some local breakdown or diminished general resistance. He crystallised his views in the now famous epigram, "Phthisis is but the last verse of the song, the first verse of which was sung to the infant in its cradle."

Behring's views have been extended by Hamburger, who compares tuberculosis with syphilis, and maintains that it is as difficult to reinfect in one as in the other. The primary lesion is the local infection of infancy, the secondary stage comprises the glandular, osseous, articular, and serous localisations, while pulmonary tuberculosis and the other visceral forms are comparable to the tertiary and quaternary forms of syphilis. Römer, Krause, and others explain the genesis of pulmonary tuberculosis more strictly in terms of Koch's phenomenon. From this point of view pulmonary tuberculosis is the result of re-infection or super-infection in a patient sensitised or rendered "allergic" by a previous infection in infancy or childhood. If we accept this conclusion, we can explain many of the peculiar features of the disease, especially why it is a grave disease tending to the miliary type in infancy and in individuals of races not previously exposed. It also becomes intelligible why the mortality from the pulmonary form of this disease increases after 14 or 15, while that from the non-pulmonary form diminishes or remains constant.

It would seem probable that in infancy the disease is spread in the body by the blood, whereas in later life extension occurs by lymphatic channels, direct extension, or by inhalation, and only in miliary forms by the blood-stream. What still remains unsettled is whether the re-infection or super-infection takes place from breakdown of the old lesions of childhood or from bacilli introduced anew from without. Behring and Hamburger would seem to suggest the former, in which case infection is really only of importance in early life. On the other hand, the fact that pulmonary tuberculosis is exclusively due to the human type of tubercle bacillus, whereas admittedly a considerable proportion of tuberculosis in early life is bovine, would seem to suggest strongly the possibility of exogenous re-infection or super-infection, at any rate in some cases, and that the changes in the lungs are comparable to the changes described as resulting from secondary inoculation in Koch's phenomenon.

Recently Sir Almroth Wright[2] has published suggestive observations which show that in the patient suffering from tuberculosis with febrile reactions (or auto-inoculations if we accept this view) there is a greatly increased hæmo-bactericidal power compared with the normal, and this observation may well prove to be of great importance in suggesting treatment, by directing attention to the rôle of the leucocytes rather than of the serum and tissue fluids.

VARIATIONS IN TYPE.

Pulmonary tuberculosis is clinically a pleomorphic disease. It varies from a rapidly fatal condition lasting days or weeks at most, to a condition tending to spontaneous arrest, and giving rise to few or no symptoms, with cases of intermediate character in which its course is undulatory, and may last throughout a fairly long life.

It is customary to divide tuberculosis into types, and the most useful classification is into (1) acute miliary; (2) acute caseous—(*a*) broncho-pneumonic form, (*b*) lobar pneumonic form; (3) chronic fibro-caseous; and (4) fibroid. We may correlate these different types with variations in infective dose, heredity, susceptibility, the immunity responses or environment according to our personal views, but it is important for us to recognise as soon as possible to which type our patient belongs, for upon this recognition our prognosis and our treatment must largely depend. At the same time we must remem that these types are not hard and fast, that t disease is one in which it is difficult to forecast, a that in all types except the acute miliary, drama changes may occur either spontaneously or as result of treatment.

One of the most acute of the wise aphorisms of late Dr. Samuel Gee was, "Never give a defin opinion as to how long a patient suffering fr phthisis will live; for the only certainty is, that you do, you will be wrong."

The great problem of treatment in pulmon tuberculosis is that relative to the ordinary chro fibro-caseous type. It is customary to divide course of this form of the disease into stages, and this purpose the Turban-Gerhardt classification most generally employed.

PRINCIPLES OF TREATMENT.

At the outset I may state that I propose to c sider treatment of the individual patient suffer from this disease as the aspect of treatment m germane to the work of this society. I feel that collective character of the work being done un the ægis of the Ministry of Health to deal with disease from the sociological and public hea aspects may in some degree militate against interests of the individual patient, although the offi scheme is practical, helpful, and elastic. As pra tioners it is our duty to do the best for the patient w consults us. It is becoming increasingly diffic for us to do so. There is no disease in which diagn and treatment in the earliest stages is of more cru importance, yet the student gets less and less opp tunity of studying the symptoms and signs of t disease, as it comes more and more under the cont of the health authorities and appears less and in the out-patient department and wards of teaching hospitals. Again, the dispensary and sanatorium are the centres round which the offic diagnosis and treatment are pivoted, whereas it in the home and the hospital where the initial sta are best studied, and it is the general practitioner the great majority of cases who sees the cases in earliest and curable stage, and upon whom responsibility of early diagnosis rests. Notificat by him brings the case within the purview of tuberculosis authorities, and may be of great va as the means of securing treatment for those limited means.

The first principle of treatment should be to see the case as early as possible, and for this purpose is necessary to be on the watch for suspicious sy ptoms. Early suspicion in cases of obscure illnes the attitude of mind we must cultivate. To ena the practitioner in the future to do this it seems me that it may be necessary to affiliate more of tuberculosis dispensaries to the teaching hospit and to increase the opportunities for undergradu and post-graduate study of the disease in all stages. I feel also that a short stay as resid clinical assistant in a sanatorium might be a v valuable form of post-graduate study if it could arranged.

The second principle is to recognise the type a stage of the disease and to adapt treatment according

The third principle is to increase the resist power of the individual by every means in our pow The study of occupation, of environment, and of p sonal history becomes of the greatest importance. present, unfortunately, our chief means of increas immunity are indirect and non-specific.

The fourth principle is to secure as complete r as possible to the diseased lung or part of the l with a view to localising the effects of the dise and preventing systemic toxic reaction, or, in oth words, auto-inoculation. It may be a question even yet the importance of this factor in treatm is sufficiently recognised, except by those in da contact with the problems of tuberculosis, and it certainly not understood by the majority of patie and still less by their friends. The object is

[2] THE LANCET, Feb. 2nd, 1924, p. 218.

onvert the lesion from an open to a closed condition, om a spreading toxic process to a localised, non-oxic healing one.

DIAGNOSIS OF ACTIVE DISEASE.

It is obvious, therefore, that to determine what eatment it is best to recommend for a given case, e must first diagnose the presence of active tuber-ulosis, and then assess the type of the process, its calisation, and the degree of activity. It must be pparent that it is well-nigh impossible to do these ings in a single interview, no matter how exhaustive how careful the examination may be, and it is nportant that it should be generally realised that o make a diagnosis may involve careful observation or some days at home or in a nursing home. This is ow appreciated by the Ministry of Health, but is ot recognised by private patients.

It may, therefore, be of interest to inquire what nformation we should try to secure in order to make working diagnosis. We need a full and careful istory, as regards the family, the previous illnesses, nd, if possible, the habits, occupation, environment, nd even the personality of the patient. We should btain a detailed statement as to the symptoms, heir onset and progress. This is often difficult, but is well worth the labour and patience it often equires. Then the physical signs must be most arefully worked out, and great attention paid to mall variations from the normal which may often ave to be interpreted in terms of the symptoms. We should look specially for symptoms and signs of oxæmia. At the same time it must be emphasised hat extent of physical signs is no criterion of activity, nd may be a fallacious guide to prognosis. A record f temperature spread over several days and if pos-ible more than the usual morning and evening read-ngs, since the rise in this disease may occur at nusual times—e.g., late in the evening or early in the fternoon or even in the morning—is essential. With uch information as a minimum we may usually obtain tentative diagnosis with some probability as to ccuracy, but no certainty. We must therefore try o secure other evidence.

Sputum Examination.—The presence or absence of ubercle bacilli is too often taken as almost the sole riterion of diagnosis and of activity. This is incorrect n both directions, since some cases of undoubtedly ctive disease may be closed and not show tubercle acilli, while in some cases in which they are present here may be practically no symptoms and the patient nay be capable of an active life, if he realises his estrictions and his public duties.

X ray Examination.—This is a record of very great alue, which will doubtless become more generally sed even than at present. It should, however, be ept until after the information suggested above has een obtained, when its results can be correlated herewith and placed in the correct perspective. I egard X ray examination rather as a means of onfirming the presence of tuberculosis, of revealing ts extent and the presence of complications, than as a neans of diagnosis. It is also essential in deter-nining the application of some forms of treatment, specially that by artificial pneumothorax. It may lso afford valuable information as to the progress after reatment.

Apart from the means of diagnosis, what we most eed is some means of assessing activity in patients vith doubtful signs, and in those in whom the clinical eatures suggest arrest or obsolescence. Much pioneer ork has been done in this direction, but a reliable nethod is yet to seek. Other sputum tests such as he presence of albumin are not specific.

Tuberculin reactions, especially the subcutaneous nd the quantitative Pirquet, may give useful nformation, but the former is not devoid of risk and is napplicable in cases with fever, while the latter cannot e taken as a strict measure of activity.

Complement Fixation.—These tests are on trial, and mportant claims have been made by some observers. There is, however, at present too big a margin of error to allow of reliance being generally placed on the results.

Opsonic Determinations.—In my experience these may be of value in special hands, but they have practically been given up owing to technical difficulties.

The Wildbolz auto-urine test and its serum modification do not seem to justify the claims made for them.

It is familiar to all that even with all this information there may be an element of doubt in our appraisal of a closed case of tuberculosis or a difficult case with obscure signs. We have often to act on the balance of probability, and may take comfort from the fact that it is a less serious error to send a patient with some obscure condition causing ill-health to a health resort than it is to fail to recognise and treat an early case of pulmonary tuberculosis.

INDIVIDUAL TREATMENT.

In selecting treatment for a given case we must give due weight to family, financial, and personal considerations. It is wise always to consider carefully the patient's personal predilection, but never to be argued into a course which we feel to be unsuitable.

Treatment may be at home, in a nursing home or hospital, a sanatorium, at some mountain resort, or at some marine or other climatic station, and at various stages a case may be suitable for several of these in sequence.

Home Treatment.—In the febrile stage home treatment may be the most suitable—provided that conditions are favourable and that the practitioner in charge is familiar with the principles of treatment, and further, that the patient and those in attendance, whether relatives or nurses, carry out instructions literally. When toxic manifestations have abated and the fever has subsided, then removal to sanatorium or other place may be considered. It should be remembered that toxic symptoms may be present with little or no fever. Home treatment may also be best suited for chronic, slowly progressive cases in which other measures have failed, for cases complicated by visceral metastases or by other conditions, and also for advanced cases, if the risks are realised and due precautions are taken. That home treatment is possible throughout the disease even in large towns has been repeatedly proved. In America this form of treatment has been organised and developed to a greater extent than in this country, especially by S. A. Knopf in New York, and by Pratt in Boston. The latter has developed what is known as the "class method," which has also been used in Montreal. The methods employed are worth study, as much ingenuity has been shown in devising methods to secure as much open air as possible, and to give help and advice to patients. For the majority of cases, however, home treatment should only be used as a preliminary to treatment at a sanatorium or elsewhere. In this connexion it is well to utter a word of warning. Too often, while the patient is waiting to be received into a sanatorium, he works hard to clear up his affairs, and fails to regard himself as under treatment. Rules should be given to him as soon as the disease is diagnosed.

Nursing Home or Hospital.—For domestic or financial reasons, it may be impracticable to carry out the necessary preliminary treatment at home. In this case a period in a nursing home or hospital may solve the difficulty. Homes for advanced cases for all classes except the rich are a great need, as it may be very difficult to place a case who is not in any sense a candidate for one of the homes for the dying and yet requires institutional treatment.

Sanatorium Treatment.

There is no form of treatment about which so many misconceptions exist as that in sanatoria, not only on the part of the public, but even in the minds of some members of our own profession. I regard this form of treatment as of the greatest value, and I believe there is a stage in the majority of cases, other than the acute, when it may be the best form to adopt, not only for its educational value, but as a means of achieving arrest

in the shortest time. On the other hand, to regard sanatorium treatment as the standard treatment for every case and to send unsuitable cases is uneconomical, unkind, and useless. A sanatorium filled with unsuitable cases is not a sanatorium, but a country hospital for advanced cases, for which it is ill-equipped and unsuitable. Sanatorium statistics, of which there is almost a glut, seem to agree upon one point only—viz., that the best results are obtained in the so-called first-stage cases and in those without tubercle bacilli in the sputum. This serves to emphasise the importance of early diagnosis and of the selection of suitable cases for this treatment. Only in this way does sanatorium treatment become economically sound, whether for industrial cases or for the well-to-do.

It is a truism that the success of sanatorium treatment depends more upon the personality of the superintendent and upon the manner in which the institution is run than upon its situation. At the same time, success is dependent not only upon the right type of case being sent, but also upon the loyal coöperation of the patient. The practitioner sending a case may help materially by instructing the patient as to the rôle of sanatorium treatment, and endeavouring to prepare him for its restrictions.

The types of case suitable for sanatorium treatment comprise: (1) Early cases without fever; (2) early cases in which fever has subsided and the patient is able to be up at least four hours a day, and preferably six to eight hours; (3) old arrested cases with slight breakdown; (4) most cases in which artificial pneumothorax has been successfully established; (5) cases after pleural effusion. It should be remembered that it is not the duration of the disease or the extent of the lesions, but the degree of activity and of toxic reaction which have to be considered most.

Cases unsuitable for sanatorium treatment are: (1) Cases with active spreading disease showing fever and toxæmia; (2) cases with severe complications likely to require much nursing and prolonged stay in bed; (3) cases with chronic bronchitis, chronic arthritis, or with severe cardiac embarrassment; (4) tuberculosis in the elderly or aged. The conditions are apt to be too severe, and the restrictions unduly irksome; (5) certain patients of shy personality and home-loving character to whom removal to any institution is a matter of dread or dislike. Occasionally such patients settle down and do well, but as a rule they do better at home or under favourable conditions in country surroundings.

Character is a great factor in recovery. Sanatorium treatment fails sometimes in persons of not very robust personality, in whom we find marked deterioration of will and initiative. They become selfish valetudinarians, and wander from sanatorium to sanatorium, or remain for years at one, even after the disease is quiescent, thus becoming useless parasites on their relatives.

The question as to how long a patient should stay at a sanatorium is difficult to answer. It is often impossible for financial reasons for him to remain till arrest is complete, as this may mean a year or more, if set-backs from extension or from over auto-inoculation occur. In general, we may say that it should be at least four months, and, if possible, six or eight. Change to another sanatorium is often desirable when progress is slow. Change may also be of value in affording different surroundings, varied diet, and fresh amusements. Diet is a matter which should be very carefully studied in sanatoria, for there is a tendency in some to provide a definite weekly sequence of meals, which becomes monotonous and therefore unappetising.

Climatic Treatment.

A belief in the value of climatic change in this disease dates from Greek and Roman times. The proved value of the Swiss mountain resorts has appealed strongly to many people, and this form of treatment has been very popular in the past. The war period and the restrictive measures taken in various colonies, dependencies, and foreign countries to prevent the entry of tuberculous persons ha lessened the opportunities for this form of treatme and in any case it must of necessity be larg confined to the well-to-do.

Climatic resorts may be classified into mounta marine, inland, and desert. For this disease we m select places in which abundance of fresh air a sunshine are the rule, and where there is comparat freedom from dust and strong prevailing, ra bearing winds. Mountain climates have great adv tages in the pure rarefied air and the changes induces in the respiratory and circulatory syste also in the greater diathermancy of the air at th altitudes.

Mountain Resorts.—The Swiss resorts are th most convenient for patients in this country, and these there are many to choose from, at sufficien varied altitudes. Davos (5150 feet) has a lo reputation behind it, and accommodation to s patients of moderate means as well as the m affluent. Arosa (6000 feet) is now more eas accessible than formerly, and treatment here is w organised. St. Moritz (6090 feet) has developed n for other conditions than tuberculosis, and with arrangements for winter sports and for the healt is less to be recommended for the sick. Monta (5000 feet) has an unrivalled situation and a g record in sunshine. Leysin (4690 feet), the Mecca heliotherapy in surgical cases, has also accommo tion for pulmonary patients. For levels of ab 3000 feet there are Les Avants and other places the neighbourhood of Montreux. Other mount stations are those in the Rocky Mountains, such Colorado Springs and Denver, and those in t Adirondack Mountains, but these are not practica available for patients from this country.

Treatment at these mountain stations is chi suitable for patients out of health in whom diagnosis is doubtful, as they can receive treatm without the stigma too often attaching to patie who have been in a sanatorium, for patients w early afebrile disease or with localised disease a little fever, and for some chronic slowly progress cases, in whom ordinary treatment has failed secure arrest. It is important to recognise t there are many cases which should not be sent the mountains. Among these are advanced ca with active spreading lesions and toxæmia, ca with severe recurrent hæmoptysis from excavati or gross disease, or indeed any recent hæmopty cases with complications, particularly laryng involvement or enteritis, cases with extensive fibr disease and those with emphysema, cardio-vascu disease, or albuminuria. If good progress is ma the patients should stay till arrest is complete, a in many cases it may be wise to remain for a seco winter. Many patients leave for lower statio during the period of melting snow, though this not necessary and is sometimes risky. They sho not return to this country till May.

Marine Resorts.—It is usually believed that t actual sea coast is unsuitable for cases of this disea but the reason for this belief is obscure, and in a case it is said that the disadvantages disappear short distance inshore. The coast resorts in t country are very numerous. The French and Itali Riviera may be of use in cases of arrested disea but are less adapted for cases requiring active tre ment. Arcachon also is a convenient and suita winter resort for cases without much active disea Madeira, the Canaries, Morocco, and the No African coast may also be considered for cases quiescent disease, those with slight activity, a those with catarrhal conditions, but rarely for th with active signs. Sea voyages are now universa given up except for cases in which the disease arrested or quiescent.

Inland Resorts.—The moorlands in these islan especially those of Scotland, Yorkshire, and Dev afford ideal conditions for some cases, and go results are often obtained. Other suitable places

'alifornia, the high veldt of South Africa, and various places in Australia and New Zealand, but these are no onger possible to patients from this country.

Desert Stations.—The Egyptian deserts are sometimes advised, but are not ideal owing to the matter of dust. Practically the only places at all suitable are Helouan and Mena House, Ghizeh. Luxor and Assouan involve a long and tiring journey, and have a very short season.

General Management of the Case.

Having decided upon where treatment shall be carried out, it is necessary to determine and map out what that treatment shall be. The basis of treatment should be what Fishberg, to whose monumental work on this disease most workers in tuberculosis are deeply indebted, calls "the traditional therapeutic triad—air, food, and rest." At the outset it is wise to explain to the patient the reasons for the recommendations given. Patients are more likely to submit to the various restrictions and rules if they grasp that each one is given on reasoned grounds and not as a capricious or oracular pronouncement.

If treatment is to be commenced at home, the most suitable room should be selected, if possible one with a south or south-west aspect, and one from which the patient can easily be moved into the open when weather conditions permit. The furniture should be reduced to the minimum consistent with comfort, and arrangements made to reduce dust to a minimum, especially during the cleaning of the room. If the patient has to remain in bed for a prolonged period it is an advantage for him to spend the night in a different room or in a different bed. The windows should be widely opened, but direct draughts must be avoided, and in patients with catarrhal or bronchitic tendencies the room may be warmed to a suitable temperature. The rigours of the winter cold may be mitigated as far as is consistent with abundance of fresh air. The clothing on the bed may be varied as necessary, so that the patient is not cold and uncomfortable. The blue and chilblained extremities, so often seen, should be prevented if possible.

Outdoor shelters have a value, and should be introduced where possible, but there are times when the discomforts involved outweigh the advantages of the extra exposure to fresh air. When the patient is allowed up, the clothing should be warm and comfortable, but not excessive. Life in sanatoria soon leads the average patient to fear chill less as a cause of colds than infection. Flannel underwear is usually advisable, and loose comfortable warm clothes, with good boots, giving protection from wet and damp. If afebrile, the patient may have regular baths, cold or warm according to his custom, or if in bed with fever he may be sponged or blanket-bathed with as little disturbance as possible. In men with cough and sputum it is best to advise clean shaving.

Smoking.—Where there is much cough or active disease with fever, and in cases with laryngeal tuberculosis, it is best to avoid smoking. It may be permitted in moderation to cases where arrest is satisfactory, but inhaling should not be permitted.

Sputum.—It is of the greatest importance to instruct every patient, and those in charge of him, as to disposal of sputum, and the risks of indiscriminate cough. This is even yet not universally done. A difficult task is often that of explaining the great risks of infants or young children brought into contact with cases of open tuberculosis even for brief periods. It is desirable that this should be as widely known as possible, if the incidence of the disease is to be controlled. We want to make adults less anxious about their own risks, which are comparatively small, and much more concerned about those of the young, which are very great.

Diet.—The hyperalimentation of the early sanatorium days has given place to a more rational dietary. It is now recognised that gain in weight is not by itself curative. We should aim at improving general metabolism and restoring the patient to his "highest known weight." This having been achieved, the diet may be modified or cut down. A caloric value of from 3000 to 3500, according to the patient's build and amount of exercise, is usually ample, and only exceptionally in patients doing heavy work is it necessary to go beyond this. The increase may be made in protein up to a total of ¾ lb. of cooked meat a day, or part may be given as fish or eggs. Tuberculous patients usually tolerate fat well, and fat is generally regarded as of special value in this disease. It may be given in any palatable form. Milk is often given in large quantities at each meal, but when other food is being taken the amount should generally be less than two or three pints. Carbohydrates may be considerably increased where active muscular work is being done.

The diet should be as varied and as palatable and appetising as possible. Few patients go through their treatment without some degree of dyspepsia and anorexia, and it may require much care, patience, and ingenuity to secure an adequate and agreeable diet, particularly in patients confined to bed with fever. It is, however, remarkable how often patients with considerable rises of temperature retain their appetite, and can deal with more ordinary diets than patients febrile from other causes. Raw meat sandwiches have been recommended and may be tried. They can easily be made palatable, and may be taken with a little burgundy in the morning. Alcohol may be allowed in moderation to those accustomed to it, but as a rule it should be given up and milk or milk and soda-water taken instead. Various special diets, like the grape cure of Meran, sour milk, and the exclusive use of milk, have been recommended, but come under the category of freak or fad treatments.

Rest and Exercise.—It has been happily said that rest is the one treatment which has stood the test of time. Hilton's classical work has emphasised for all time the value of rest in the treatment of painful or diseased parts. In this disease complete rest is essential as long as there is fever and toxæmia, and, as we shall see, local rest to the diseased lung is a valuable means of treatment when it can be achieved. In febrile cases what is known as "absolute" or typhoid rest is usually necessary. The patient is kept completely recumbent and is waited on completely, not even being allowed to feed himself, or to get up to go to stool. This may be necessary only for a few days, or may require to be kept up for weeks or even months. It should be relaxed as soon as possible in order to encourage the patient. Rest, by lowering fever, lessening auto-intoxication, and localising the disease, is the most effective means of treatment we have yet evolved. The difficulty often is to persuade the patient that it is necessary and beneficial. He or his friends think it is weakening and are apt to attribute all his symptoms to it. It is here that sympathy and confidence between doctor and patient become of great value, and if we can convince him of its necessity a valuable step in treatment has been made.

Not only fever, but other indications of toxæmia and of auto-inoculation, such as headache, anorexia, dyspnœa, quick pulse, weakness, and depression may all render rest essential. Moreover, an excessive auto-inoculation from work or exercise, a local extension, or some intercurrent condition may render a return to bed necessary. It is usually stated that with a temperature of 99·5° or 100° the patient should be put to bed. This is true, but a more valuable indication is the general record of the temperature and pulse from day to day. An early morning rise or a quick pulse may indicate a fresh extension or an over-inoculation and necessitate return to bed. It is only when the temperature becomes steadily normal or subnormal that we can consider allowing the patient up, and gradually increase the time up and then permit exercise. The rate at which this may be done is one of the most difficult problems and requires judgment and experience.

THE PHYSICAL BASIS OF EMOTIONAL DISORDER.[1]

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IT has been claimed in the name of psycho-analysis that "every neurosis is caused by a psychic conflict." Without desiring to generalise on the pathogenesis of the neuroses, I propose in this paper to show how inadequate is such a conception. I submit that a theory of the neuroses based upon "the wish," or on the conflict between ego and social impulses is narrow to the point of being misleading, however valid it may be in a partial application. Further, I suggest that, apart from the Freudian theory, in actual practice psycho-analysts tend to seek in emotional experience the causation of all but a limited group of the neuroses. It appears to me that, however important the psychogenic factor may be, we must recognise that somatogenic factors are rarely absent, and that to approach the problem of the neuroses exclusively from the standpoint of psychic conflict is to compromise our therapeutic opportunity unjustifiably. Or, if we are determined to reduce our equation to terms of psychic conflict, let us frankly realise that one or other side of the conflict is frequently conditioned by factors of a biological nature, which are not beyond the reach of physical treatment. The neuropath brings life to a standstill, and the psychopath retreats from it, in each case because of his inability to orientate himself to the future. Is it not reasonable to suppose that much of this inability is based upon an awareness of organic inadequacy?

The value of the following formula should be considered as covering the ætiology of a large group of neuroses: Awareness of incapacity to meet a demand for adaptation present or impending. It will be convenient to discuss the subject under four headings: (1) Alimentary, (2) vascular, (3) endocrine, (4) sexual. These headings are not offered as a classification, as I am aware that they overlap at many points.

Consciousness of Alimentary Inadaptability.

It is clearly within the experience of each one of us that our emotional feeling tone is influenced by the minor physiological disequilibria of an empty stomach, a loaded colon, or a congested liver, and practical physicians are prepared to discount the emotional reactions associated with such states. But when a condition of this kind becomes chronic we may reasonably suppose that an equally chronic emotional distortion occurs which should preclude any thought of psychological treatment. Only a few months ago I saw a patient, X. M. M., who had undergone several months' treatment by an analyst for what he diagnosed as a mild anxiety neurosis. Being none the better, she consulted a surgeon, who removed a portion of her colon. She now claims to be well. I have no wish to express an opinion on the expediency of either form of treatment, still less do I wish to identify myself with the view either of the analyst or of the surgeon—both of which are known to me—but I am prepared to say that, if both lines of treatment were indicated the order in which they were carried out cannot be justified. I would go the length of surmising that the analyst must have spent a good deal of his time in attempting to resolve complexes which would have resolved themselves had the patient's feeling tone been more normal than is that of a typical case of chronic coprostasis. In other words, I believe that the psychic conflict which caused the anxiety neurosis was based on a general awareness of incapacity to meet the demands for adaptation which her daily life imposed on the patient. If I am correct, then the proper procedure would surely have been to eliminate first the factor of intestinal toxæmia which produced this sense of physical inadequacy.

Influence of Vascular Tone on the Emotions.

It is probable that few of us are sufficiently alive to the influence of blood pressure on emotions. The sensitiveness of the brain to high and low blood pressure, and to instability in blood pressure, whatever be its exact nature, is one of the factors most frequently responsible for emotional disorder. The patient with a consistent hypopiesis must inevitably experience a sense of mental, if not physical, inadequacy, and it may well be a matter of surprise to us when such a patient fails to show clear symptoms of emotional instability. There is a constant sense of inadequacy which may produce an anxiety state or else a constant craving for stimulating experience. Thus we have a considerable class of alcoholics whose craving for alcohol is fundamentally based on this sense of inadequacy due to a low cerebral blood pressure. Doubtless they all have their conflicts, which are bound to be exaggerated by the physical condition, but to say, as the psycho-analysts have said, that "All alcoholism is due to homosexuality," is gross misrepresentation which can only lead to therapeutic puerilities. On the other hand, there is a school of thought which deals largely in exhaustion neuroses and psychoses. The term seems to me a very unfortunate one unless it connotes curability by rest alone. Many of these cases are blood-pressure problems, and mere rest is neither a certain nor permanent cure for disorders of cerebral vascularity. Again, the mere fact of vascular instability has its emotional implications. The man of 60 whose arteries are beginning to harden finds that at certain times of the day his concentration fails him or uncontrollable somnolence comes over him. Surely we are justified in regarding this as a cause for deep concern on the patient's part—the sense of his failing capacity to meet the demands for mental activity which his business involves?

The Endocrine System and the Psyche.

It is impossible for us in the present state of our knowledge to have any exact conception of the influence of the internal secretions on the emotional life. But in regard to the thyroid, at any rate, we have some definite knowledge.

D. H. E., a woman of 32, consulted me for breathlessness, lassitude, and generalised fear. She had a pulse-rate of 120, slight exophthalmos, and a greatly enlarged thyroid. I sent her to a surgeon, who expressed unwillingness to attempt surgical interference. The patient was therefore ordered rest, and a colleague of mine undertook her analytic treatment. A mass of repressions was revealed. She had a profound father complex and a recent history of active homosexuality. She made some progress, but when she began to go about again her symptoms returned. The surgeon then consented to operate and extirpated a considerable portion of the gland. She made a good recovery, went to work, and has been fit for her work ever since, as far as I am aware.

Now in this case I am open to conviction that the psychic conflict was the sole cause of the hyperthyroidism, though I suspect that an element of bacterial infection must at one time have been operative. Let us, however, grant that the condition was primarily psychogenic. It remains undeniable that the physiological implications of the emotional conflict had reached a point at which no redress of the emotional equilibrium could effect a remedy. In short, emotion had affected function and function had affected structure to a point from which there was no recovery by the path of the original onset. Or let us look at this case another way. Granted that the original psychic conflict centred round the parental and homosexual complexes—in other words, that the original emotional disorder was due to emotional experience—I submit that the conflict was greatly exaggerated by the sense of physical incapacity, an incapacity which was successfully dealt with by physical means, and I add that until this secondary

[1] A paper read before the Section of Psychiatry of the Royal Society of Medicine on Feb. 12th, 1924.

source of conflict was dealt with it was impossible for the patient to resolve that part of her conflict which centred round her sex life. Furthermore, the most striking result of the surgeon's work was the lessened capacity for fear, presumably due to increased stability of all her motor reactions. This case seems to me an illuminating example of the action and reaction between thyroid function and emotional disturbance.

Another case of some interest is the following:—

D. C. H., aged 10½, brought to me for uncontrollable weeping. He was at a first-rate preparatory school where his environment was excellent. The boy lived with his brother and sister in the care of an aunt who appeared to be a first-rate foster mother. Both at home and at school he wept incontinently and without any apparent reason. His intelligence was said to be fully average. He was good at games and notably plucky. But all his masters reported the impossibility of putting up with a boy thus afflicted. During his interview with me he wept copiously and almost continuously. He said he cried because he thought of his father and mother. Now his father had been blown up at sea when the boy was about 5. He was said to have seen little of his father and never to have been at ease with him. In due course the mother married again. The step-father was particularly kind to the boy and the boy seemed fond of him. A year previously both mother and step-father were killed in a railway accident. On the physical side he was of normal physique, his pulse-rate was normal, but there was a definite thinning of the eyebrows on the external side.

The emotional situation was very intriguing, being complete down to the Hamlet touch, and I venture to surmise that many analysts would have felt justified in treating this patient. I put him on thyroid. In a week he was better; in six weeks he was perfectly normal; and I afterwards was able to confirm from my own observations the claim of his head master and of his aunt that he had been completely transformed.

The Function of the Thyroid.—But without choosing definitely pathological examples we may recognise the constant influence of the thyroid in the balance of ideation and expression. The thyroid has been recognised as the great anabolic reservoir of the whole system; it has been described by Leonard Williams as the female gland par excellence; it has been regarded—probably erroneously—as the determinant of bacterial immunity. Langdon Brown has suggested that it corresponds to the extravert principle in psychology. This last view falls in with my own conception of it as the gland of creation. We can at any rate, without indulging in speculation, recognise in the activity of the thyroid the principal determinant of expression. Now the sub-thyroidic introvert is an under-expressed individual who cannot fail to have numerous repressions and who easily falls a prey to an anxiety neurosis. I recognise in him primarily a case for thyroid administration, being convinced that a great deal of his anxiety will clear itself up without any analytical treatment when the balance between ideation and expression has been redressed. His psychic conflict consists largely in that sense of inferiority which arises from his inadequate powers of self-expression. In other words, the awareness of incapacity to meet life's demand for expression is the essential feature of his conflict, and it is a feature eminently amenable to the simplest form of therapeutic aid.

The Adrenals.—We cannot consider thyroid action exhaustively without discussing the adrenals as well. No correlation between emotion and physiological function is better established than the effect of fear on the "fight or flight" mechanism—that is, fear stimulates adrenal activity, this stimulates the sympathetic, the vagus equilibrium is upset, and the thyroid stimulated to increased secretion. Many of us, no doubt, recognised during the war the remarkable difference between what may be described as objective and subjective courage. One man would display the utmost heroism in the face of imminent danger, who nevertheless was tortured before by the anticipation or afterwards by the memory of the same danger. Another would appear unaffected before and after, and yet display terror in the presence of the actual danger. It seems to me that these differences must depend primarily on the responsiveness of the adrenal system. With some, fears in phantasy are sufficient to determine an adrenal reaction, while with others nothing short of objective danger produces this result. With some the response is biologically efficient, and with others it fails to produce an adaptation which is biologically favourable. Hence, in the great class of psychic conflicts which centre round the instinct of self-preservation, we may reasonably assume that an important element often consists in the awareness of adrenal inefficiency leading to the incapacity to adapt to situations of danger. I am not prepared to maintain that this factor, although it is largely a physiological one, is capable of being dealt with on a physical basis, but I am optimistic enough to hope that with greater knowledge of the subject this will come to be the case. I am encouraged in this hope by the undeniable effects of adrenal therapy in asthma. Here we have a condition in which analytical treatment has repeatedly revealed the psychogenic importance of fear complexes. It seems to me quite impossible to harmonise these two therapeutic methods of known value unless we picture the condition as a vicious circle in which fear promotes hyperadrenia and hyperadrenia promotes dyspnœa and dyspnœa promotes more fear, and so on.[1] The asthmatic is therefore an individual aware of his incapacity to meet certain demands for adaptation of a respiratory nature, and this awareness constitutes, in my view, a part of his psychic conflict which already we can, to some extent, treat on a physiological basis.

The Balance of the Autonomic Nervous System.—This problem of sympathetic stimulation is important enough to demand further discussion. The balance between sympathetic and parasympathetic activity must unquestionably be of no less consequence to the feeling tone of the individual than cerebral vascularity. The sympathico-tonic is neither more nor less incapable of meeting life's demands than the vagotonic. The first with his uncomfortable tension, his exaggerated response to stimulus, and his variable moods is as far from the mid-line of well-being as the second with his dull, relaxed, and apathetic lethargy that only intense stimuli can affect. The sympathico-tonic fears life because he cannot tolerate it when it becomes unduly stimulatory, whereas the vagotonic fears it because he can only tolerate it under these conditions. I submit, then, that both types are alike aware of their incapacity to adapt to a world in which stimulus is necessarily inconstant.

Interaction of Developing Glands.—Now, if we pass to a more general survey of the endocrine system, we are at once confronted by the antagonism between the glands of childhood and those of maturity. Our ultimate fate in life is so intimately bound up in this conflict that we are justified in surmising that it has far-reaching emotional implications. When and how the thymus and pineal yield to the gonads are the questions upon which turn not only our physical stature, but also our mental and, in some measure, our moral stature. Analytical psychology is largely taken up with the persistence of puerile characteristics. It is surely impossible for us to contemplate the tendency involved in such regression apart from the physical side. The high-grade defective is no doubt immune from the attentions of the intelligent analyst, but there are definitely subnormal types, many of them characteristically thymo-centric, whose thumb-sucking or other childish proclivities are apt to become the subject of solemn and arduous exploration. Without throwing any aspersions on the familiar psychological explanation of these manifestations, I venture to suggest that emotional immaturity might be approached—in certain cases, at any rate—from the point of view of physical

[1] The factor of specific sensitivity to foreign proteins is omitted not because I ignore it but because it seems irrelevant to the present discussion.

immaturity. We are all familiar with the inferiority sense of the high-grade defective, associated as it invariably is with a train of compensations in phantasy and behaviour. We recognise that in his case psychic conflict centres round his awareness of incapacity to meet the ordinary demands of life. We are prepared to admit that if any physical treatment could render him more efficient, his inferiority sense would be mitigated and its psychological implications reduced. I venture to suggest that there are many neurotic individuals who, while they cannot be classed as defectives, are yet immature psychologically and physically, and that their treatment should be regarded primarily as a problem of organotherapy, albeit a problem still unsolved.

The Sexual Aspect of Mental Disharmony.

The question of maturity brings us naturally to the consideration of the sex aspect of our subject. First of all let me say that if we are to see this problem in its true light, we must recognise that the biological objective of every individual must, from an evolutionary standpoint, be parenthood. I think we are often apt to lose our way in this wood because of the number of trees—chiefly phallic, of course—which constitute it. The gratification of the sex appetite is constantly referred to in terms which suggest that it is a terminus ad quem. This is surely superficial. The individual may, and constantly does, detach the hedonic from the procreative aspect of the function, but biologically the two are inseparable, and it is reasonable to suppose that unconsciously they are much more united than they are in consciousness. I think there is analytical evidence of this. If, then, we regard the achievement of parenthood as an impending demand for the male and the attainment of parenthood as an impending demand for the female, we see how readily psychic conflict may arise from any awareness of incapacity to meet this demand. Let us consider a few sex problems in this light.

Masturbation.—Let us first take masturbation. It is a mistake, I think, to regard it as mere gratification of an animal appetite. The capacity for sexual response, even of an autoerotic character, is to some adolescents proof that they have reached a phase of development which is at least on the path to maturity, and as such the practice has a reassuring value. Now an adolescent with normal self-confidence neither requires nor obtains any such reassurance. If, then, some adolescents differ from others in respect of this self-confidence, I submit that one ground of difference is in the gonad adequacy. It is true, of course, that much depends on the conscious recognition of the nature of the procreative demand and that when this recognition is premature the fear of procreative inefficiency is likely to follow, apart altogether from a sense of physiological inadequacy. But in certain cases the conflict that centres round masturbation derives its intensity from this awareness of incapacity to meet the impending demand to achieve or attain parenthood. Biologically the aim of every boy is to make his father a grandfather. Thus, and only thus, can he satisfy himself of his biological maturity. Social and business promotions have little influence; the youth may become the active partner in the business and replace his father there; he may attain to the social status which has ceased to interest his father, but from the broadest point of view he has not satisfied his urge to displace him until he also has begotten a son as his father begot him. Now regarded in this light the problem of dementia præcox becomes susceptible of a reasoned solution. Let me take an example recently seen.

D. S. is a law student, aged 22. Father, an active and intelligent man, who had forced the lad to ride when he was a small boy in spite of constant terror; subsequently, he had found fault with his inefficiency at school and at the age of 14 had threatened to horse-whip him. The patient has been a masturbator since puberty, the practice being associated with masochistic phantasies. He now complains that he cannot concentrate on his studies. His mind is perpetually obsessed by insoluble problems and impossible phantasies of a masochistic nature. This hebephrenic tendency is passing into his general life, and he is continually assailed by such characteristic questions as, "What would have happened if I had shut that door instead of leaving it open?" On the physical side we find that the patient needs to shave only once in two days; puberty came on at 16; at 12 he had mumps.

This latter statement may sound peculiarly irrelevant, but I must be allowed to reiterate my conviction that mumps occurring between the age of 10 and puberty, even without orchitis, has some deep significance in relation to gonad inefficiency. Now we see here a picture of a boy submitted from childhood to paternal repression and made to feel that maturity was an unattainable prospect and yet with every reason to wish to displace his father. But he feels physiologically inadequate; he regresses in phantasy more and more while deriving satisfaction as a result of masturbation, from the assurance that he is at any rate better than a child. If a motor-car fails to climb a hill it is always possible to say that the hill was too steep. But it is also possible to say that the engine was not sufficiently powerful. Unless we consider the problem in the light of the ratio of the power to the gradient, we naturally get no nearer to a solution.

That is why it seems to me that Mott's conception of dementia præcox as attributable to gonad inefficiency is just as unsatisfactory as the analytical theories which stress exclusively the emotional barrier causing the regression. In other words, I believe that the patient just described might have made a normal adjustment to life in either of two cases: (*a*) if his view of adult life in general and of paternity in particular had been less menacing; (*b*) if his gonad efficiency had given him that confidence which would have enabled him to believe in his ultimate capacity to make his father a grandfather. Now if this view be correct the therapeutic inference is obvious—namely, that it is our duty to attack the early case of dementia præcox not only from the analytical point of view, but also from the physical, and it is fortunate that something can be done in such cases by organotherapy.

Coitus Interruptus.—This is one sexual irregularity to which the psycho-analysts have given ample importance. While I do not claim that the consequent neurasthenia can be classified under the general heading of awareness of incapacity to meet life's demands, I should like to say two things. The first is that out of a considerable number of cases with this causation I can only recall one in which there was not a perfectly definite focal infection. Hence I profoundly distrust the treatment of this condition that ignores the toxic side. The second thing I have to say is that primarily coitus interruptus disintegrates the endocrine system rather than the emotional life. The act consists in a volitional interruption of the most powerful chain of reflexes in our nervous system, and its effect is mainly to throw a strain on the adrenals which in course of time results in adrenal exhaustion. This is my second reason for distrusting the psychotherapeutic approach to such cases, at any rate, as a first approach.

The Menopause.—The menopause presents problems in every department of medicine, with the possible exception of orthopædics. The menopause has necessarily the most profound significance from an emotional point of view for the woman whose maternal aspirations are unsatisfied. But in helping the patient to adjust to the cessation of her generative possibilities we must not ignore the endocrine side, for the withdrawal of the ovarian hormone has a repercussion on both thyroid and adrenals, which is of the greatest importance. A temporary vagotonia ensues which, if it replaces a previous sympathicotonia, determines grave physiological changes. To ascribe the neuroses of the menopause to psychic conflict is to express a partial truth.

Cyclothymia.—Finally, I would refer very briefly to the bewildering problem of cyclothymia and its

less frequent but more obvious manifestation of manic depression. I fancy there is no analyst of any experience but has been fooled by a cyclothymic. Without recognising the true character of the condition, we begin an analysis of a patient who appears to be suffering from an anxiety neurosis. Sooner or later the patient begins to improve, and if the analyst is human he begins to congratulate himself until he recognises the true situation either by undue exaltation or by an inexplicable relapse into depression. If we watch such a case over a period of several years, we recognise that the emotional reactions belonging to one phase have no relation to those manifested in the opposite phase; we note generally a fairly exact periodicity, and above all the fact that the transition from one phase to another is totally independent of emotional factors—favourable or adverse. Patients of this type are prone to be "cured" by whatever treatment happens to be in use at the time that the change comes. I cannot say whether the milder manifestations of cyclothymia are classed as neuroses by those who claim that every neurosis is caused by a psychic conflict, but I am very certain that the key to this problem will never be found in the realm of pure psychotherapy.

Conclusion.

In conclusion let me say that I have spoken, it may seem, in a derogatory way of analytical treatment. If I have done so, it is not because I am doubtful of its value or unconvinced by its successes. Rather do I feel that the therapeutic contribution of analytical psychology is too important and its possibilities too valuable to be exposed to criticism and even ridicule because of the apparent incapacity of certain analysts to correlate their psychological theory with physiological observation.

THE CULTIVATION OF TISSUES IN SALINE EMBRYONIC JUICE.

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IT is 13 years since Harrison[1] first demonstrated that tissue cells would grow outside the body. It required little imagination to perceive that by this fundamental observation several fields of investigation were likely to be opened up; there was the possibility of old problems being attacked by new methods and of knowledge accruing which would almost certainly throw light on the mystery of malignant disease. The expected development of a technique by which tissue cells could be cultivated with the ease and certainty associated with the artificial growth of bacteria has failed to materialise. Many new facts have been learnt, but the plasma method worked out by Burrows, Carrel, Ebeling, and others has proved rather troublesome in its application to elucidate the problems of the growth of tissue cells. More than anything, a simplified but certain means of inducing cells to grow is a necessity if progress is to be made. This aspect of the subject was attacked in this country by A. H. Drew,[2] who in 1922 published the formula of an artificial culture medium from which plasma was eliminated. This was the starting-point from which proceeded the investigations dealt with in this communication. A great deal of time was spent at the initiation of the experiments by attempts faithfully to follow the description of Drew. It was found impossible to prepare the saline medium according to this investigator's account, owing to the fact that magnesium hydrogen phosphate $MgHPO_4$ is practically an insoluble salt. For this reason Drew's medium was discarded and a saline solution prepared, which, as far as possible, contained the inorganic elements found in plasma in similar concentrations. The next object in view was to ensure that the solution should have a hydrogen-ion concentration optimum for growth and that it should not easily change; that the solution, in fact, should be buffered. The carbonate-bicarbonate system, whilst a very desirable one, was rejected in favour of the phosphate system, the latter having the advantage of being made up of solutions which will stand autoclaving. The saline solution which has given the best results is made up as follows:—

Stock Solution A.

Sodium chloride NaCl	12·11 g.
Potassium chloride KCl	1·55 g.
Calcium chloride $CaCl_2$	0·77 g.
Magnesium chloride $MgCl_26H_2O$	1·27 g.
Water	100·00 c.cm.

Stock Solution B.

M/69 sodium dihydrogen phosphate $NaH_2PO_4{\cdot}H_2O$	5 c.cm.
M/69 disodium hydrogen phosphate $Na_2HPO_4{\cdot}12H_2O$	55 c.cm.

These solutions are autoclaved. For use take: Distilled water, 90 c.cm.; stock solution A, 4 c.cm., and autoclave. When cool, add 6 c.cm. of stock solution B with a sterile pipette. The resulting clear fluid will be referred to in future as the saline solution.

The pH of the solution lies between 7·3 and 7·6, using phenol red as the indicator. A comparison of the proportions of the several acids and bases in it with those found in plasma exhibits a fairly close agreement.

1000 c.cm. plasma of man contains*:—		The recommended solution contains:—	
Na_2O	4·290 g.	Na_2O	2·618 g.
K_2O	0·393 g.	K_2O	0·360 g.
CaO	0·155 g.	CaO	0·155 g.
MgO	0·101 g.	MgO	0·100 g.
Cl	3·612 g.	Cl	3·695 g.
P_2O_5 (in animals), 0·052–0·085.		P_2O_5	0·082 g.

* R. H. A. Plimmer: Practical Organic Biochemistry, 1915.

The only discrepancy is in the percentage of sodium. This is accounted for by the absence of carbonates in the fluid, a deficiency imposed by the necessity for sterilisation by autoclaving. Owing to the fact, however, that there are the weak phosphoric acid radicals present in the solution, in an amount agreeing with the proportions in plasma, the number of dissociated active, and therefore, from our point of view, significant sodium ions is probably not widely different from that in blood plasma.

It may well be asked whether the solution contains the phosphates in a high enough concentration to be sufficiently buffered for the purposes of growth. The addition of acid to the medium alters the pH according to the following experimental findings:—

Vol. of Solution Used, 5 c.cm., pH 7·4.

Drops N/100 H_2SO_4 (1 drop = 0·025 c.cm.)

Drops	pH	Drops	pH
1 gives	7·2	6 give	6·8
2 give	7·2	7 ,,	6·8
3 ,,	7·0	8 ,,	6·6
4 ,,	7·0	9 ,,	6·6
5 ,,	6·9	10 ,,	6·6

Indicator phenol red in each instance.

When acid is added to distilled water under the same conditions the pH changes very much more quickly, as the following result shows:—

Vol. of Water Used, 5 c.cm., pH 7·1.

Drops N/100 H_2SO_4 (1 drop = 0·025 c.cm.)

Drops	pH	Drops	pH
1 gives	6·6	8 give	4·5
2 give	5·0	9 ,,	3·8
6 ,,	5·0	10 ,,	3·5
7 ,,	4·8		

Drop 1: Indicator phenol red. Drops 2 to 10: Indicator brom-cresol blue.

The buffering of the saline solution is seen to be not of a high order, and although only weak acids are produced by metabolic activity, it was considered

[1] R. Harrison: Jour. Exp. Zool., 1910, ix., 786.
[2] Jour. Exp. Path., 1922, iii., 20.

to possess rather a narrow margin of safety. Tissues will grow if the proportions of phosphates, and so the degree of buffering, are increased even up to M/50 concentration, but this raises the amount of the phosphate to an undesirable figure, and was proved to be quite unnecessary when tissues are grown in embryonic juice as described below, for the buffering of this juice is much greater than that of the original solution.

The following experiment shows this:—

Vol. of Saline Embryonic Juice Used, 5 c.cm., pH 7·3.

Drops N/100 H_2SO_4 (1 drop = 0·025 c.cm.)

Drops		pH	Drops		pH
1	gives	7·3	9	give	7·0
2	.. .. ..	7·3	10	.. .. ..	7·0
3	.. .. ..	7·2	11	.. .. ..	7·0
4	.. .. ..	7·2	12	.. .. ..	7·0
5	.. .. ..	7·2	13	.. .. ..	7·0
6	.. .. ..	7·2	14	.. .. ..	7·0
7	.. .. ..	7·2	15	.. .. ..	6·9
8	.. .. ..	7·1	16	.. .. ..	6·8

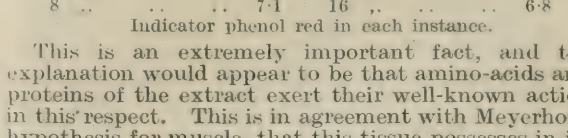
Indicator phenol red in each instance.

This is an extremely important fact, and the explanation would appear to be that amino-acids and proteins of the extract exert their well-known action in this respect. This is in agreement with Meyerhof's hypothesis for muscle, that this tissue possesses in its colloids more effective buffering substances than in its inorganic salts.[3] The pH of the drop of fluid after growth in it has taken place for 48 hours was found by a perhaps rather inexact estimation with phenol red to be unchanged. The technique employed for obtaining cultures differs somewhat in detail from the method of other investigators and will now be described.

Apparatus Required.

(1) A box such as has been described by Drew is of inestimable value. With its aid cultures have been made throughout these investigations in a laboratory in which there is a great deal of human traffic. Yet an infection is a rarity. The box can safely be left open on the side facing the operator, and, if the work be done on a glass slab or tiled bench, it is of advantage that there should be no bottom to it. Before beginning, the inner surfaces of the box are simply wiped with a clean wet cloth (Fig. 1). Other requisites

FIG. 1.



Box and apparatus for making cultures in a laboratory where much other work is carried on.

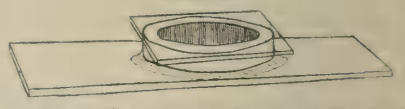
are: (2) a metal plate on which to perform manipulations with a rod running parallel to it to act as a rack; (3) a metal rack for supporting pipettes and needles; (4) microscopic slides; (5) glass squares, made by cutting microscopic slides into three equal parts; (6) glass rings, 20 mm. in diameter and 2 mm. thick, ground top and bottom; (7) small wool-plugged centrifuge tubes; (8) pieces of glass tubing, wool-plugged at each end, for drawing out in the blowpipe to make pipettes; (9) a cement made up of equal parts of paraffin wax, melting point 52° C., and vaseline (a number of cements have been tested; pure paraffin wax is pervious to air and allows evaporation to take place through it; mixed with an equal quantity of vaseline it has not this drawback); (10) carbon dioxide snow, easily prepared from a cylinder of compressed gas; (11) forceps and fine scissors; (12) glass blocks; (13) small Petri dishes (14) two metal needle-holders and No. 10 Hagedorn needles. Nos. 2, 3, and 14 are sterilised by flaming 4 to 8, 12 and 13 by dry heat at 150° C., the instruments by boiling or dry heat.

[3] Pflüger's Arch., 1922, cxcv., 22.

Method of Setting Up Cultures.

Embryonic mouse and chicken tissues have been used. The latter are the more convenient, and have the advantage that the age of the fœtus is accurately known. The blunt end of an incubated egg having been washed over with alcohol, the shell is cracked and an opening made large enough to extract the embryo, which is put into a small Petri dish, where it is washed in the saline solution. It is then placed in a hollow glass block, where it is cut up with scissors until it becomes a mush. This is transferred by pouring into a sterile wool-plugged test-tube. The tube is then inserted into the carbon dioxide snow where its contents quickly freeze hard. After thawing the process is repeated. Approximately an

FIG. 2.



Slide, cell, and covering-glass square in readiness for placing in the incubator.

equal volume of saline solution is then added to the thawed product, which is shaken up well, and sedimentation allowed to take place for a few minutes. The supernatant liquid pipetted off, centrifuged to clear it further, and diluted with an equal volume of saline solution, constitutes the culture-medium. Embryos of 10 to 14 days are most convenient for making the saline juice.

The cells in which the tissue is cultured are made as follows. In a porcelain dish or seamless metal syringe-box, some cement is melted and heated enough to ensure its sterility. A glass ring is then seized with fine forceps, plunged into the molten cement, and dropped on to a sterilised microscopic slide, which is gently warmed on the under surface to render the junction of ring and slide quite impassable to air. The slide is then placed ring downwards, leaning on the rack and metal stage. The tissue to be cultivated is dissected from the embryo and, after rinsing in the saline solution, is cut up into small pieces by means of the Hagedorn needles, which have, of course, cutting edges. The prepared slides are then arranged on the metal stage, rings upwards, and on each is dropped from a pipette a small volume of the culture-medium. With the needles a piece of tissue is placed on each slide and the drops of solution spread out by manipulation. Unless the tissue adheres to the glass, growth will not take place. Adhesion fails to occur if the drop be too large. Each cell is then closed by covering it with a heated glass square. The whole cell is then inverted so that the drop of culture-fluid hangs dependent from the microscopic slide. The preparations are placed thus in the incubator. The cell is seen in Fig. 2.

Results to be Expected from Exhibition of This Technique.

If the above instructions be scrupulously followed, growth of fibroblasts can be confidently predicted in nearly every preparation (see Figs. 3–6). Frequently there is 100 per cent. of growth; the average works out at approximately 85. Growth can usually be detected in 18 hours, and it reaches its maximum intensity ordinarily in about 48 hours. Tissue cells, however, are far less robust than bacteria, and are much more exacting in their requirements. The method is pre-eminently suitable for the growth of fibroblasts. Since observations under the microscope must take place through the thickness of a microscopic slide, high powers cannot be used. The preparation of stained specimens is, however, very much

simpler and more easy than when cover-glasses are employed. An excellent fixing medium is 5 per cent. acetic acid in 70 per cent. alcohol. Staining is done by Heidenhain's iron hæmatoxylin method.

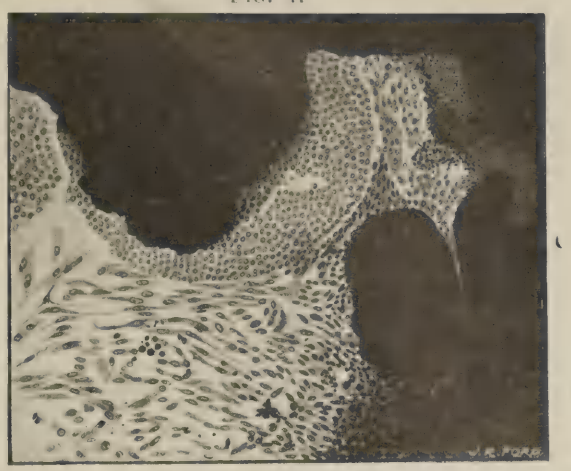
Growth will not continue for more than about three days after it has begun. Then signs of degeneration appear. What is the cause of this cessation of growth? The possibilities which have been considered are disappearance of nutritive material, lack of oxygen, the accumulation of injurious products of metabolism. The problem of continued growth in saline juice resolves itself into the discovery of a

FIG. 3.

Fibroblasts growing in saline embryonic juice. Fifty-three hour culture of muscle tissue from eight-day chick embryo.

device for maintaining the conditions in being which were present at the initiation of the experiment. A further communication on this subject will be made. It suffices here to say that the degenerative processes from our observations are due to the accumulation of metabolic waste material in the medium. With the technique described it has not been found possible to get continued growth for longer than six to seven days, though there is not the slightest doubt that this problem can and will be solved, so that maintained growth will be as possible as with plasma technique. Those who have worked at tissue culture will recognise how much more convenient is the examination of growths when fibrin is absent and the cells are all arranged in one extenuated sheet. The development of a technique along these lines is much to be desired.

FIG. 4.

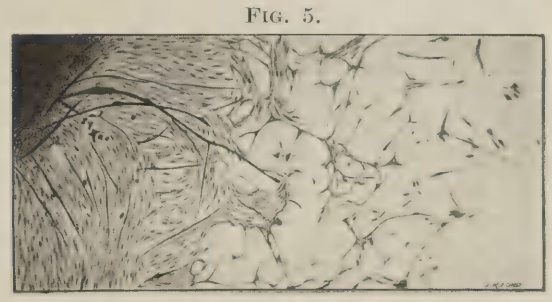


Growth of fibroblasts and epithelium from the subcutaneous tissue and skin of a six-day chick embryo. Forty-eight hour culture.

The Part Played by the Saline Medium in the Growth of the Tissue.

The saline solution is not to be considered as a culture-medium sufficient in itself. It is true that growth will often take place, sometimes quite

FIG. 5.



Fibroblasts and embryonic muscle fibres growing from a piece of muscular tissue of an 11-day chick embryo, cultivated for four days. The piece of tissue was transferred to a new cell after 48 hours.

vigorously, if a piece of tissue is simply placed in the solution alone, but its occurrence is not to be depended upon. The essential nutritive material is contained in the embryonic juice. Cultures can be obtained if normal saline solution made with tap-water be substituted in preparing the extract, but the degree of success attending its use is rather uncertain. For one thing, the pH of normal saline made in the ordinary manner is not very constant, and apt to be too alkaline for ideal conditions; whilst washing the tissues in it must partly deplete them of all those inorganic constituents which are missing in its composition but

FIG. 6.

A part of the preparation shown in Fig. 5 under a higher magnification.

present in the lymph which bathes the tissue. For these reasons, a saline solution of certain composition approximating to that of plasma, as far as inorganic constituents are concerned, of known pH, and buffered to some extent, appears to be a much preferable medium to employ. When a certain amount of growth takes place without embryonic juice, it seems fairly clear that the necessary food material is derived from the central part of the implanted tissue which dies and macerates. It is an uncertain process upon which to rely.

This communication concerns itself solely with technique. It is not the place to describe the behaviour of cells in artificial culture. The biological needs of the growing cell are very imperfectly known. Yet step by step the conditions which must exist will eventually be discovered. In such a quest the standardisation of the controllable factors is essential. This work is an attempt to effect this in the case of the inorganic constituents of the medium in which the tissues are grown. It has been done as part of the activities of the Surgical Clinical Unit at St. Mary's Hospital in the constituent laboratories of the Pathological Institute, facilities having been generously accorded by Sir Almroth Wright, Dr. John Freeman, and Prof. B. J. Collingwood, to whom we offer our most grateful thanks.

THE ACTION OF BAYER "205" IN TRYPANOSOMIASIS.[1]

BY F. K. KLEINE, M.D.

BAYER "205" is a complex organic body which contains neither arsenic, mercury, nor any other metal and thus differs from other remedies so far used in sleeping sickness. Chemo-therapeutically, it is standardised to act in such a manner that a mouse infected 24 hours before with nagana trypanosomes can be permanently cured of trypanosomiasis by a single injection of 1/10 mg. per 20 g. body-weight. Clinically, results as good as those recorded by Dr. G. C. Low and Dr. P. Manson-Bahr[2] have been obtained by other investigators.

In a recent expedition to Africa an experimental station was established at Ndombo, a negro village in the neighbourhood of Mpika, and later in the Belgian Congo. The parasites are transmitted by tsetse flies, but not directly. A fly feeding first on an infected and then on a healthy person does not infect the latter with its proboscis as with a vaccinating lancet. Before the fly becomes infective the parasites it has ingested must undergo a certain development which requires several weeks for its completion. Thus the parasites and glossinæ stand in a similar relation to each other as do malaria parasites and anopheles.

The trypanosomes in animals studied in this expedition were (besides *T. theileri*) *T. brucei*, *T. congolense*, and parasites of the *T. vivax* group. These can be differentiated by their morphology and specific pathogenesis. In human beings two kinds of trypanosomes may be observed, *T. rhodesiense*, the producer of the sleeping sickness in Rhodesia, transmitted by *Glossina morsitans*, and *T. gambiense*, the producer of the ordinary sleeping sickness on the Congo, transmitted by *Glossina palpalis*. The morphological difference of the two kinds may not be constant. The fact that two species of *Glossina* are involved does not disprove the identity, as both these flies are able to transmit both trypanosomes.

Attempts to Induce Prophylaxis in Cattle.

From the point of view of the economic life of South Africa, as well as that of the Congo, it is of special importance to know whether it is possible to protect cattle prophylactically against trypanosomiasis so that valuable animals can be driven without danger through infected areas to healthy places. For this reason it was attempted to find out first of all how long after the administration of Bayer "205" the prophylactic protection lasted.

The methods employed in Rhodesia were as follows: Fly-catchers were sent out to collect a few hundred flies which were allowed to feed on animals previously treated. On the following day the flies were fed on a healthy dog. If the dog became infected it was a clear indication that the cattle had also been bitten by infective flies. In the Belgian Congo, where a larger number of cattle were available, animals treated with Bayer "205" were allowed to be bitten by flies under natural conditions. As soon as trypanosomes were found in the blood of the control animals, all animals were withdrawn from the fly-belt and transferred for further observation to a place which was free of flies. As a result of these experiments in Rhodesia and on the Congo it was shown that even after large doses of Bayer "205"—e.g., 10 g. for a bullock of about 5 cwts., repeatedly given, it was not possible to prevent infection by trypanosomes. *T. theileri*, as well as *T. vivax* are scarcely influenced by the drug. The development of *T. congolense* and especially *T. brucei* is suppressed for a short period and, sometimes after several weeks, the trypanosomes will reappear.

Special attention was paid to the action of the drug in *T. brucei* infections. In its numbers in the blood as well as in its capacity for development this parasite was restrained in such a way that to prove its existence in the blood of cattle it was necessary to inoculate monkeys with large amounts of the blood. Even after its transmission to monkeys, there were certain indications of the continuation of the action of the drug. A normal, uninjured strain of *Trypanosoma brucei* can easily be detected microscopically in monkeys' blood, but parasites originating from the treated cattle could be found only with difficulty and sometimes they would disappear entirely for many days. Their virulence was reduced and the enlargements of the spleen in diseased animals was only slight. In spite of their slight virulence, the trypanosomes did not react to the dose of Bayer "205" generally effective. In experiments of this kind it is imperative to ascertain for each species of animals the dose *which under normal conditions* exercises an influence on trypanosomes, the sensitiveness of the parasites to a drug depending largely on the type of animal host and must not be estimated on the basis of weight when different species of animals are under consideration.

Again, while it is possible by injections of Bayer "205" to render mice immune against subsequent infections of trypanosomes for months, a complete protection in cattle has not yet been obtained. The diminished virulence of the trypanosomes resulting from the action of Bayer "205" was, however, noticeable in the experimental cattle. Combinations of this drug with tartar emetic gave greatly improved prophylactic and therapeutic results. It is still too early to draw any conclusion as to the possibility of practical prophylaxis.

Experiences in Treatment of Trypanosomiasis in Humans.

A more definite demonstration of the value of the drug is afforded by the experience gained in treating human trypanosomiasis. Three stages of sleeping sickness were distinguished: (1) blood infection, (2) enlargement of the glands, (3) infection of the nervous system. Stages 1 and 2 are most important from an epidemiological point of view, since in the initial stages natives go about without knowledge of their illness and form a constant source of re-infection for the flies. Whether patients suffering from sleeping sickness can be spontaneously cured is not known, but on the analogy of other diseases this seems possible.

Results in Rhodesia.—In Rhodesia 35 patients were treated. How many belonged to the third stage cannot

[1] An abstract of a paper read on Feb. 21st to the Royal Society of Tropical Medicine, in whose Proceedings the paper will appear in full. [2] THE LANCET, 1922, ii., 1265.

definitely be ascertained, as a lumbar puncture was rarely made before the beginning of treatment, but the percentage is probably a high one, since about half the patients had to be carried into camp. The diagnosis was made by demonstrating parasites in the blood and a subcutaneous injection of 1 g. of Bayer "205" in 5 c.cm. of warm physiological solution of sodium chloride was given under the skin on the back near the spine, at the height of the middle of the scapula, and was repeated twice at an interval first of 10 and then of 18 days. Patients with trypanosomes in the cerebro-spinal fluid (C.S.F.) or showing a relapse on blood examination were given a fourth and fifth injection. The pain following the injections varied—some experienced very little discomfort. Sometimes an inflammatory swelling occurred, disappearing in a few days, and formation of abscesses occurred in four cases.

The clinical results of the treatment were controlled by frequent blood examinations. One European who discharged himself prematurely died later on from sleeping sickness, and one native died suddenly and unexpectedly seven days after he had received his fourth injection, no autopsy being obtainable; but the remaining 33 patients showed after a few weeks a surprising improvement in bodily strength. In October, 1922, about three months after the commencement of treatment, lumbar punctures were made in 21 patients, and in 8 of these trypanosomes were found in the C.S.F., the blood being free from parasites. Whether the trypanosomes finally die off or whether an aggravation of the clinical condition eventually occurs cannot yet be stated. The cases in which trypanosomes were found in the C.S.F. were those who originally presented symptoms of infection of the central nervous system, the symptoms having almost entirely disappeared. Six patients who still had trypanosomes in the lumbar fluid gave a general impression of vigour and performed heavy work. It can only be assumed (1) that Bayer "205" is able to exercise some influence upon the parasites in the brain, and (2) that the trypanosomes which are not killed off at once in the body by its agency are greatly reduced in virulence.

On April 13th, 1923, the death of three treated persons was reported, two of them having been previously noted as being severely affected, and the third having had an abdominal tumour which may have caused her death. The remaining 30 patients were reported to be alive and apparently well, which results can be regarded as exceedingly satisfactory, the period of observation after treatment being between six months and a year.

Results in the Congo.—Of 150 patients under observation in the Congo most belonged to the first and second, and about 10 per cent. to the third stage. The diagnosis was arrived at by microscopical demonstration of living parasites in fluid from enlarged glands in the neck or in the blood; the technique will be found in the full report of the paper. Of 32 patients, 24 had trypanosomes in glands *and* blood, 4 only had them in the glands but not in the blood, and 4 in blood and not in glands. In each patient only one blood preparation and one glandular preparation were examined. Generally speaking, if there are parasites in the glands, they can also be found in the blood. In patients not previously treated it is unnecessary to resort to lumbar puncture for a diagnosis.

In order to determine whether trypanosomes are present in the C.S.F. of patients without nervous symptoms, lumbar punctures were made on 24 mentally normal patients, the result being uniformly negative. Even in psychically abnormal patients trypanosomes were not always to be found in the C.S.F. In such cases, however, the number of lymphocytes is always increased. The patients in the Congo received *intravenous* injections on the first, third, and fifteenth day, 1 g. of Bayer "205" at each injection. The drug was dissolved in 10 c.cm. of rain-water and injected into a vein of the arm. Children received a proportionately smaller dose—viz., 0·4 to 0·6 g.—in the jugular vein. Patients seriously ill and those with trypanosomes in their C.S.F. were mostly treated at ten-day intervals, but more than five injections were never given. Patients prefer intravenous to subcutaneous treatment, as it is painless. Care was taken to use an initial large dose to prevent the parasites from getting accustomed to Bayer "205."

In all persons in the first and second stage of the disease a feeling of improvement was soon noticeable. Strength returned and the glandular swellings subsided. Among 96 patients whose blood was examined every few days for five months after the third injection trypanosomes were found only in the blood of two children, two or three months after the third injection. Whether these were actual relapses or fresh infections cannot be decided. A remarkable improvement occurred in two maniacal patients; of two others, one died accidentally and the other one ran away. Seven patients in the third stage of the disease who had previously been treated with other remedies showed no improvement clinically under Bayer "205"; in two of these patients trypanosomes were found in the C.S.F., but the blood of all of them was permanently free from parasites. Similar results were not obtained by us with atoxyl, salvarsan, or antimony, the trypanosomes always returning to the blood within one to three months.

Certain Disadvantages.—The albuminuria which follows injections of Bayer "205" tends to disappear after a time. Injections should not, however, be repeated too often. The parasites get accustomed to the drug, and its action upon the host cannot be ignored. In cattle treated too intensively a reduction in the coagulability of the blood was followed by inflammation of the kidneys, fatty degeneration of the liver, and jaundice of all tissues. When, after four injections of Bayer "205," trypanosomes reappear and remain in the blood a change to antimony should be made. The actual percentage of patients cured by Bayer "205" cannot yet be stated, but the patients will be re-examined in the course of the year. At any rate, at the present time Bayer "205" would seem to be the best remedy for sleeping sickness.

No definite proposals are made as to the systematic treatment of an epidemic, since various methods can be employed in various parts of Africa. In some parts the natives can be moved from threatened districts, in others the glossinæ may be stamped out. Drug treatment is of importance, since the blood of infected patients can be sterilised for some time, thus withdrawing from "healthy" flies the source of infection.

THE USE OF SILVER FILIGREE IN THE RADICAL CURE OF HERNIA.

BY PERCIVAL P. COLE, M.B., CH.B. BIRM., F.R.C.S. ENG.,

SURGEON TO THE SEAMEN'S HOSPITAL, GREENWICH, QUEEN MARY'S HOSPITAL FOR EAST END, AND THE CANCER HOSPITAL.

IN a recent monograph, "Hernia and its Radical Cure,"[1] the use of silver filigree has been uncompromisingly condemned. The author's conclusions are based entirely on objective evidence, for it is admitted that he has had no personal experience to guide him. The book has been favourably reviewed in the medical press, and the case against the filigree therein presented must be regarded as authoritative, for by silent acquiescence medical journals have approved the author's thesis. THE LANCET[2] says, "comparisons of various procedures are made in a fair and broad-minded spirit," and again, "metal filigrees are condemned, and the author's opinions are confirmed by the increasing rarity with which such materials have been employed in recent years." It is my purpose, first, to defend the filigree, by endeavouring to refute the objective evidence

[1] By J. Hutchinson. Oxford Medical Publications.
[2] THE LANCET, 1923, ii., 333.

brought against it in this monograph, and secondly, to urge its use by the presentment of subjective evidence of personal experience.

To arrive at a correct assessment of an author's conclusions, importance must attach equally to the substance of the objective evidence, and to the method of its employment. What is the substance of the case against the filigree? Do the author's methods of presentment merit the approval thus expressed? The case against the filigree is not gradually unfolded, the evidence is not carefully elaborated before the conclusions arrived at are stated. The author's attitude is quickly and forcibly expressed, and the reader is prejudiced against the method in that the surgeon will, it is stated, be led to resolve "under no temptation will I bury silver wire—or silver filigree either—in a patient's groin." This resolution, it appears, will be forced upon the surgeon by the perusal of Bloodgood's cases published in 1900, and of the late Mr. C. B. Lockwood's cases published in 1905.

The Basis of Criticism.

Now, however eminent the observers, and however convincing their observations, no reasonable surgeon will be bound by the findings of 20 years ago, unless the conditions of practice are essentially the same. It is not too much to say, I think, that a surgical genius, though a boon to his own generation, is sometimes a curse to posterity. His blindly admiring disciples uphold his teaching and advocate his methods of practice long after their utility as an end-product has been superseded. The surgical history of the recent war provided outstanding examples of this blind adherence to methods adapted to the technical facilities of a past era. That the conditions of practice 20 years ago were very different from those that now obtain will be readily conceded. Surgical technique has progressed very considerably, particularly in the domain of foreign body surgery. The Lane plate and the bone graft are outstanding products of modern practice. That the author's sweeping condemnation is entirely unjustified by the references indicated is clearly established by investigation of their substance.

Bloodgood's cases refer to the use of buried silver wire sutures, a very different matter from the implantation of a filigree. Even in this respect it is interesting to note the following passage from Bloodgood's publication.[3]

> Clinically, the results in the healing of the wounds have been much better since the introduction of silver wire and silver foil. Before the introduction of silver wire, 116 cases of hernia had been closed with silk; in 28 of these cases (24 per cent.) there was more or less suppuration. Since silver wire was first used there have been 330 operations with 14 suppurations (4·2 per cent.).

In those days, then, silver wire was found to be a less irritating foreign body than silk! Bloodgood also states that rubber gloves had only been used by him and his assistants as a routine measure since 1897.

The Lockwood reference I have been unable to trace, but in the volume referred to[4] Lockwood discusses the advantages and disadvantages of rubber gloves, and advises against their use in many operations as they interfere too much with tactile sensation.

Discussion.

The style of this initial criticism scarcely augurs well for an impartial survey. In the further discussion of the use of filigree some purely supposititious and unbacked objections are cited. It is stated, for instance, that there is a risk of the filigree "shifting in position or crumpling up, so to speak." No filigree should shift its position once it has been snugly adapted to its bed. Any change of position is an indication not of defective operation but of a defective operator. Again, before crumpling can be urged as an objection it must be shown: (1) that a filigree does crumple, and (2) that such crumpling is detrimental. The construction of the filigree is such as to determine a certain flexibility. This flexibility is of considerable advantage, for it permits an accurate and automatic adaptation of the filigree to the bed in which it lies.

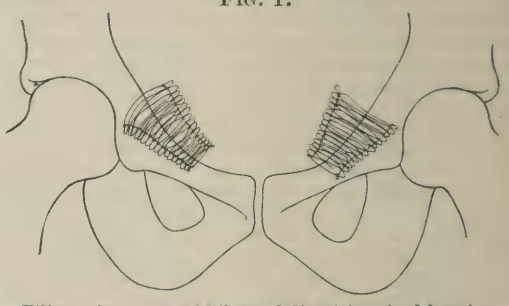
The answer to this objection is, then, first, that the filigree does not crumple; secondly, that its natural flexibility is one of its essential characters. It would appear that this crumpling is a feature alleged to characterise the behaviour of the filigree more particularly in the groin, for it is stated that—

> In the groin (femoral and inguinal hernia) where flexion at the hips, &c., infallibly produces kinking of a rigid body like a sheet of filigree such insertion must be ill-advised.

Incidentally, the discrepancy between the crumpling of the filigree in one passage and its alleged rigidity in another is sufficiently striking.

To controvert this crumpling objection I reproduce tracings from X ray photographs of filigree cases

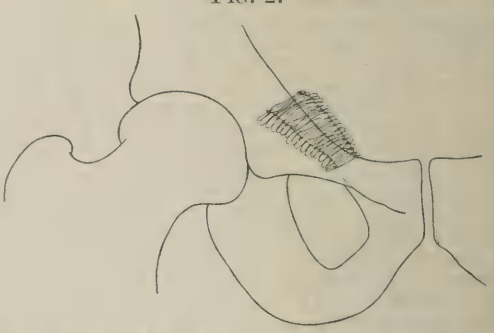
FIG. 1.



Filigree in a case of bilateral direct inguinal hernia.

taken some months after their insertion. In the one case (Fig. 1) the man, a stout seaman, was the subject of bilateral direct inguinal hernia. If ever alleged flexion of the hips could have produced a crumpling up of the filigree it certainly would have done so in this case. In Fig. 2 a tracing is shown of a filigree

FIG. 2.



Filigree in case of oblique inguinal hernia, eight months after insertion.

eight months after its insertion. Flexion of the hips constituted in this case a normal attitude at work, and it is obvious that no crumpling had occurred.

One of the strongest points brought forward to emphasise the alleged defectiveness of the filigree operation is the increasing rarity with which it is employed. This increasing rarity is based on the figures obtained from one of the largest hospitals in Great Britain between the years 1914 and 1919: the name of the hospital is not mentioned. "After 1919 not a single filigree," it is stated, "has been used in any hernia case during the last three years. The only deduction to be drawn is that it has been found to be an unsatisfactory method." It appears to me that such a deduction is entirely unjustified, and that other equally satisfactory explanations might be adduced. As opposed to these figures are those obtained from the Seamen's Hospital at Greenwich, which is by no means one of the largest hospitals in Great Britain and probably has no more than one-third as many surgical beds as that instanced by

[3] Johns Hopkins Hospital Reports, 1899, p. 225.
[4] Transactions of the Medical Society, 1905, Aseptic Surgery in Theory and Practice.

the author. From May 1st, 1922, to April 30th, 1923, filigrees were inserted in 26 cases.

Discussing the use of filigree in the radical cure of ventral hernia, it is stated that—

"Since 1918, so far as I can ascertain, not a single case has been treated by the insertion of filigree by any member of a very large surgical staff. Such a verdict after full experiments of a much-vaunted method renders further comment unnecessary."

"During the years 1910 to 1917 filigree was inserted in a considerable number of cases at the London Hospital, and it had also to be removed in a considerable number."

Now as far as I can ascertain at the Seamen's Hospital, Greenwich, no trouble of any kind has supervened in the 26 cases in which filigree operation was employed during the period of time indicated. My own contribution to this number is 12 cases, and my contribution in other hospitals and in private practice increases the total to double that figure. Throughout the whole of my experience I have only once had occasion to remove a filigree, and that experience will, I feel sure, be endorsed by many other surgeons who have adopted its use and appreciated the scope of its application. Mr. Souttar, himself a surgeon at the London Hospital, is quoted as endorsing all the author's objections to the use of the filigree. The reference given is "Souttar, *Brit. Med. Jour.*, Nov. 25th, 1922, p. 1024," under the heading of the Operative Treatment of Difficult Hernias. On consulting this reference we find that what Mr. Souttar actually did say is: "And the wire filigrees of McGavin have achieved conspicuous success."

In this article Mr. Souttar draws attention to another method dealing with difficult hernias, and it is surely more than likely that a method elaborated by a London Hospital surgeon should be employed by other surgeons at the London Hospital.

What is to happen to cases of hernia in which an adequate barrier consisting of the patient's own tissues cannot be constructed? No one, even the most ardent advocate of the filigree, pretends that its use is indicated where such an effective barrier is available. The whole question hinges on operability rate. One gathers from Mr. Hutchinson's work that cases in which the patient's own tissues are so defective as to preclude a reasonable hope of radical cure by their means, must be relegated to the weary army of truss wearers. I can find, in perusing this book, no accessory means of ridding these patients of their infirmity. Some interesting side-lights on this question of operability may fruitfully be considered. Thus on p. 37 the question of the advisability of operating on recurrent hernia is discussed, and the author's views are supported by the narration of the gloomy happenings that took place in the cases of 11 recurrent inguinal hernias operated on in St. Thomas's Hospital in 1896; seven cases suppurated, and two of these died of septic peritonitis. This narrative may mark a stage in the history of surgery, but that it can have any possible effect in deciding for or against the question of operability in recurrent hernia is surely incredible.

Again, in discussing direct inguinal hernia, the author's outlook is very conservative:—

"Some surgeons hold that direct inguinal hernia is not suitable for the operation for radical cure as recurrence is so apt to take place after it. However, I have seen several cases in which success was obtained and believe it is worth while to make the attempt provided the patient is a suitable one, that is, he is in good general health, not too fat, and free from any contributory causes, such as stricture of the urethra, &c."

In umbilical hernia the indications for operation are particularly vague. "I would urge," says the author, "that every case that is at all hopeful should be submitted to operation for radical cure." The hopefulness or otherwise of a particular case can only be guessed at by a description of a typical case, which is "a hernia the size of one's fist, irreducible for long, occurring in a stout and middle-aged woman."

What is the attitude of the filigree user towards these types of hernia? It is this: Recurrent and direct inguinal hernia, umbilical and ventral hernia, are operated on as a routine, and the patient's general condition must be very bad to determine a refusal. A considerable proportion of the cases of hernia at the Seamen's Hospital are direct cases, and were the surgeons at that institution to adopt a conservative attitude, these men would be deprived of their means of livelihood. Owing to the particular and restricted nature of the practice at the hospital, the failures return to the home of their origin. I have seen and heard of many recurrences after ordinary operations; I have never seen or heard of a case in which filigree implantation resulted in failure in any type of hernia.

Points in favour of the filigree are almost ignored, but the following grudging admission is made:—

"It should be noted in opposition to the unfavourable judgment given above that the insertion of silver filigree has had (and possibly still has) warm advocates."

In another part of the book, however, Mr. Lawrie McGavin's article on hernia in Choyce and Beattie's "System of Surgery" is quoted. Mr. Hutchinson expresses considerable surprise that the use of filigree should be so warmly advocated in such a modern work. In the last edition of this same work (Choyce and Beattie) the article on hernia has been revised by the editor, Mr. C. C. Choyce, and advocacy of the filigree is no whit less warmly urged.

Case Records.

The filigree, then, not only has had, but still has warm advocates: Lawrie McGavin and C. C. Choyce have recorded their faith in print, and I may be allowed perhaps to rank myself among the number. I propose to justify my attitude in this respect by the inclusion of some typical cases recently operated on.

Female aged 47. Appendix removed 1912, emergency operation for septic peritonitis 1919. Four months later operation for adhesions; 1920–22 gradual growth of a hernia through the left paramedian incision. She was admitted under my care, operation having been refused by other surgeons. She had a large hernia protruding through an aperture 2½ inches in diameter. The abdominal wall was a mass of scar tissue. A filigree was inserted measuring 4 inches by 4 inches. The operation took place on Nov. 24th, 1922, and she was discharged on Jan. 4th, 1923. No sign of recurrence; wound soundly healed.

Female, aged 48, very stout, with a large ventral hernia in the mid-line reaching from the umbilicus to the pubes. A filigree, 6 inches by 4 inches, was inserted, as extensive dissection demonstrated that patient's own tissues could not be utilised to form an effective barrier. Patient has been perfectly comfortable, the abdominal wall is quite sound.

Seaman, aged 36, very stout; bilateral double direct hernia with no definite sac, but diffuse and pronounced bulging of the whole posterior wall of the canal; conjoined tendon very poorly developed. This patient, contrary to usual custom, was operated on with a general anæsthetic as he refused stovaine intrathecally. He developed bronchopneumonia and coughed continuously for a fortnight. Filigree both sides (Fig. 1); wound healed normally.

Seaman, aged 59; large direct inguinal hernia, containing portion of bladder and a large mass of extra-peritoneal fat. Conjoined tendon very poorly developed. Filigree inserted. Convalescence uneventful.

Surgeon; left inguinal and femoral hernia, small oblique inguinal sac, large direct protrusion of extra-peritoneal fat; large mass of extra-peritoneal fat forced through femoral ring into thigh. Operation Sept. 26th, 1922; stovaine intrathecally, no general anæsthetic. Filigrees inserted. Since operation he has not hesitated to perform actions which incur considerable stress, such as cranking his car, carrying heavy weights, &c. No sign of any recurrence; operation area is perfectly sound.

Pathologist; oblique inguinal hernia with diffuse bulging of the posterior wall of the canal; conjoined tendon poorly developed. Operation January, 1923 (Fig. 2); convalescence uneventful. No sign of recurrence, operation area quite sound.

Ex-sergeant-major, Royal Engineers, aged 28; right recurrent inguinal hernia; operated on twice in the army, worse after each operation. When demobilised wished to enter Colonial Service, but was rejected by colonial medical officer. Operation August 23rd, 1923. The groin was a mass of scar tissue; cord verified, and isolated with great difficulty; large direct inguinal hernia, loculated sac full of adherent omentum. Hæmatoma discharged on the eighth day and continued to do so for five days. Left the nursing home in three weeks soundly healed. When seen in November the side operated on was, if anything, stronger than the side unaffected. He has now been passed for service abroad.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OPHTHALMOLOGY.

A MEETING of the section was held on Feb. 8th, Mr. A. L. WHITEHEAD, the President of the section, occupying the chair.

Operation for Senile Cataract.

Mr. BASIL LANG read two papers on related subjects, the first entitled A Modification of the Usual Method of Removing the Lens in the Extraction of Senile Cataract and the second A Modification of the Usual Method of Needling the Lens Capsule after Cataract Extraction.

In the first of these contributions he referred to a case he was told of in which a tumour was seen in one eye, lying over the ciliary body, and this tumour was regarded as malignant. No lens could be seen behind the pupil. The eye was excised and section showed it to be the lens; it had apparently been forced into that position when an attempted extraction was done. He remarked that the lens did not always begin to come forwards on the first pressure of the cornea below. Though he had watched many operators, he had rarely seen the lens born without some coaxing, or aided by the cystotome. The first effect of placing the curette on the lower part of the cornea was to decrease the intra-ocular volume, and he went on to explain in detail what he considered happened, from the point of view of mechanics, at each stage in the operation. He thought it would be distinctly advantageous if the hole through which the lens was to be delivered could be made as deep as possible in the antero-posterior diameter; this was his modification of the customary technique. Having completed a large section he lacerated the capsule with the cystotome. With the patient looking down, he pressed the scoop flat on the sclera at the 12 o'clock position with its edge in contact with the wound, and he pressed it backwards towards the centre of the globe. The wound began to gape, and the vitreous forced the lens forwards against the under surface of the cornea. Further pressure increased this gaping, and the lens began to force the iris in front of it out of the wound. On further pressure the lens edge was seen to stretch the iris until it came close up to the pupillary border, and now for the first time Mr. Lang applied pressure below with the curette against the cornea. The iris was never subjected to pressure between the sclera and the lens, and apparently had not lost its tone, and the slightest touch with the repositor or the stream from the irrigator caused it to return within the eye, and the pupil assumed a central position. His modification, he submitted, rendered the operation both simple and safe. At Moorfields, before he adopted this modification, he had 5 prolapses in 43 straightforward simple extractions. He had given up using eserine drops. In the last 31 cases at the same hospital he had had only two prolapses, one of which should not be brought into the series as the iris of that was atrophic. By avoiding damage to the iris iritis did not follow the instillation of eserine. The iris did not lie flaccid and toneless in contact with the wound; rather it was taut, thus allowing any escaping aqueous to run over its surface.

In his paper on his modification for needling the lens capsule after cataract extraction, Mr. Lang said that after the lens had been removed and the eye was quiet, it was desirable to make a hole in the lens capsule, otherwise at a remote date the visual acuity would begin to be reduced. At that date the capsule would have lost its elasticity and the operation would be difficult as the incision would not gape and any flap cut would fall back into its original place and continue to occlude the pupillary area. The needling was intended for its remote benefit rather than its immediate. In former days eyes were lost from one of two reasons: sepsis, or glaucoma, due to the angle becoming blocked by vitreous, or by exudate from a chronic cyclitis, or from both causes. The sepsis resulted from the operation tract becoming infected with organisms from the conjunctival sac, and it could probably only occur if the needle was made to enter the anterior chamber by passing it directly through the cornea. To avoid this the needle should be passed subconjunctivally into the anterior chamber. To make more sure, the surface of the conjunctiva could be painted at the point of entry of the needle with a 1 per cent. solution of silver nitrate. Whenever vitreous got into the anterior chamber glaucoma was liable to occur. This was why dislocation of the lens occasionally ended so disastrously in glaucoma; for this reason he did not advise patients to have the lens removed in its capsule, as that left the vitreous unsupported. He was careful to procure a needle of suitable proportions; if the shaft of the needle was of the correct diameter it just filled the hole and prevented escape of aqueous. If the shaft diameter were 1 the width of the blade should be 1½. His habit was to use a Bowman's stopped needle, not a Ziegler's knife; moreover, it was rarer to find the latter with a shaft the correct size. The sooner the operation was done the easier it was. He never divided the capsule if there was any quantity of unabsorbed lens matter. In the latter event, when the eye was white, he passed the needle into the anterior chamber, rotating the shaft through 90°, moving the blade paddle-fashion to stir up any lens matter. He then had the eye hot bathed, and in a few days the lens matter had been absorbed. He described his procedure with a wealth of detail. He had the room darkened and good focal illumination to enable one to see the gossamer-like posterior capsule. With a needle of the correct proportions none of the aqueous would escape from the anterior chamber, and the capsule could be cut three or four times if necessary. He summed up the advantages of this modification as follows: It was easy, it avoided the possibility of sepsis, it obviated the possibility of glaucoma, and it eliminated the necessity of stirring up the vitreous.

Dr. W. H. BRAILEY emphasised the importance of tilting the lens forward while it was being extracted. In regard to needling, he agreed that the vitreous coming into the anterior chamber was the most common cause of the subsequent onset of glaucoma following cataract extraction. The worst cases of glaucoma were due to the ingrowing of corneal epithelium through the wound.

Sir RICHARD CRUISE said it was most important to produce in cataract extraction the tilting forward of the lens which Mr. Lang had spoken of. He described the technique which he had himself employed during the past 14 years. In that time he had had only three cases in which there was slight adhesion of the iris to the lip of the wound. In none of his cases had there been prolapse.

Mr. J. GRAY CLEGG said he would be reluctant to do discission in early stages; most of his cases returned with excellent acuity of vision without this having been resorted to.

Mr. T. HARRISON BUTLER spoke of the importance in his view, of avoiding all forms of pressure in the operation. He expressed himself as an advocate of Ziegler's method of operating and of his knife. When sepsis occurred in these cases he felt sure it often came from within, from material circulating in the blood stream.

Mr. H. KIRKPATRICK said that the modification described by Mr. Basil Lang was not so radical as that which had been carried out at Madras for ten years. He detailed his own method of procedure.

The PRESIDENT said he had now reverted to the combined operation, with which he was quite satisfied. Mr. Basil Lang's modification was very interesting and probably some members would try the preliminary pressure above before exerting the usual pressure from below.

Mr. LANG replied.

Classification of Diseases of the Choroid.

Mr. MALCOLM L. HEPBURN read a paper on this subject. He said the nomenclature in relation to diseases of the choroid had always, in his view, been unsatisfactory, and there seemed to be no settled opinion as to the ætiology and course of the disease processes attacking the choroid. Fundus diseases ought to be classified according to the structure in which they occurred. The results of classification by position alone were that the terms retino-choroiditis, myopic choroiditis, choroidal atrophy, degenerations, holes, &c., were applied indiscriminately to all sorts of diseases, regardless of their pathological meaning, or whether they originated in the choroid or the retina. In this paper he dealt with choroid only. All such conditions were associated with pigmentary disturbances, but in solely retinal affections no such changes occurred. The American "Encyclopædia of Ophthalmology" contained 26 forms of choroidal inflammation which seemed to require separate headings. The classification he now put forward fell into five groups: (1) inflammatory; (2) vascular; (3) degenerative; (4) congenital; (5) new growths. The need for discriminating between the first two groups was, that in the recent stage the treatment was quite different. At present the term retino-choroiditis was used to describe both acute and scarred forms, whereas it really implied an acute inflammation. The clinical features associated with inflammatory diseases of the choroid were vitreous opacities, and sometimes keratitic deposits in the acute stage, with scotomata in the usual field. The paper was illustrated by a number of drawings.

Mr. RAYNER D. BATTEN said that even after hearing Mr. Hepburn's paper he still claimed a special place in classification for diseases of the macula, which area was singled out, anatomically, physiologically, and clinically, from the rest of the fundus. Both choroid and retina showed special reactions to disease in the macular area. He based his claim chiefly on clinical grounds, instancing that the area was comparatively exempt from attacks of syphilitic and tuberculous disease. The greatest support for his contention was in the establishment of the maculo-cerebral group. He showed a large number of drawings by means of the epidiascope in elaboration of his views.

Exhibition of Cases and Specimens.

Mr. A. D. GRIFFITH showed a male with tuberculosis which had started in the optic nerve head. When the patient was first seen there was no vitreous effusion, and the mass was obviously arising from the nasal half of the optic disc and the immediately surrounding retina. Since that date it had passed nasally forwards into the vitreous, leaving a patch of apparently normal retina between the mass and the nerve. The man had had pulmonary tuberculosis. Wassermann was negative. He also showed a baby which was brought to the hospital four hours after birth, with the right eye luxated forwards out of the orbit. It was a forceps delivery on account of placenta prævia. There now seemed to be a weak attachment to the globe. The optic nerve showed simple atrophy; clearly it had been ruptured.

Miss ROSA FORD sent a case (shown by Mr. M. HINE) of ethmoidal mucocele in a woman. Three weeks ago, when first seen, she complained of her eyes hurting her and watering. She also had occasional momentary diplopia and a chronic discharge from the right side of the nose. When, at 6 years of age, she had scarlet fever, a lacrymal abscess on the right side was opened. At about the same date she had a chronic discharge from the left nostril. There was now a cystic swelling in the left orbit, extending above and below the internal tarsal ligament, and just above the latter there was a small and rather sharp prominence in the orbital margin. On extreme movement in any direction diplopia resulted. There were no fundus changes in the left eye, and the vision was 6/9. Mr. Gay French regarded it as an ethmoidal mucocele.—Mr. GRAY CLEGG spoke of a similar case and recommended that this be dealt with from the inside.—Mr. HARRISON BUTLER considered it might be a frontal sinus condition and that the case should be handed over to a rhinologist.—Mr. R. AFFLECK GREEVES also favoured the view that this was a frontal mucocele, as the ethmoidal cases he had seen pointed lower down.—Mr. R. LINDSAY REA said that to get a good skiagram in such a case as this it was necessary to use a hard tube, preferably one with a 12-inch spark-gap.—The PRESIDENT considered this mucocele fronto-ethmoidal in origin. He agreed it should be attacked from the interior, on the nasal side. It was clearly a case to be dealt with by the rhinologist. It should give a good result, with no scarring whatever.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

A MEETING of the Federation was held on Feb. 12th at the Elizabeth Garrett Anderson Hospital, Miss M. CHADBURN, the President, being in the chair.

Dr. HELEN CHAMBERS read a paper on

The Progress of the Cancer Problem.

Dr. Chambers said she spoke with the object of arousing in the members of the Federation a sense of the importance of cancer research, and of the vast fields that yet remain to be conquered. It was her hope and belief that the Medical Women's Federation might, as a corporate body with a large available amount of clinical material, institute some scheme of research under which individual members' work might be directed, correlated, and unified, so as to yield more valuable results than might accrue from solitary effort. She spoke of research up to the present as falling under two main headings—namely, inquiry into causation (and prevention) and into treatment. With regard to the advance of knowledge in the last ten years or so, under the first heading we had undoubtedly come to recognise the important part played by chronic irritation, even though this was due to such dissimilar things as arsenic, petroleum, and parasites. The common factor appeared to be repeated death of cells in a localised area, and the inference might be that a breakdown product of such cells acted as a growth stimulant. Dr. Chambers dealt as examples with cancer of the mouth and pharynx in men and cancer of the cervix in women. She put forward also some suggestions as to the part played by skin parasites as irritants in cancer of the breast and Paget's disease of the nipple.

Under the heading of treatment, operations and irradiation by X rays and radium were discussed, and the possibility of the production of an antigen-immune body reaction was touched on. Dr. Chambers's remarks on the necessity of a thorough understanding of the principles of X ray dosage, and the danger of increasing the rate of tumour growth by ill-timed and insufficient treatment were stimulating. She pointed out the difference, often forgotten, between the experimental laboratory animal and the human patient, and from this point of view regarded immunisation of the cancer patient as still only in the realms of speculation. She insisted, however, on the importance of Coley's work, in spite of its empirical nature, and held out some hope of greater biochemical knowledge in the future.

Discussion.

Dr. EVA WHITE mentioned a paper by R. Knox, in which it was suggested that at only one period of its life was the malignant cell susceptible to the action of X rays. She wondered whether this, if true, would affect treatment. She also suggested vaginal ionisation as a prophylactic against cancer of the cervix.

Dr. LOUISA MARTINDALE said she had noticed that in cases where she had used X rays to produce atrophy of the ovaries, if an insufficient dose was used at

first, the subsequent effective dose had to be much larger than usual. She spoke briefly on the Erlangen treatment of inoperable cases.

It was proposed by Lady BRISCOE, and seconded by Dr. EVA WHITE, that a committee should be formed to draw up a plan of campaign with regard to the proposed part to be played by the Medical Women's Federation in cancer research, and Dr. Chambers, Miss Chadburn, Dr. Martindale, Lady Briscoe, and Lady Barrett were proposed and elected.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY.

THE annual meeting was held at Manchester on Jan. 18th, when Prof. A. DONALD (Manchester) was elected President for the ensuing year.

Exhibition of Cases and Specimens.

Dr. LEITH MURRAY (Liverpool) showed a para-vaginal lipoma weighing 17 oz. removed from a woman aged 25. On a mistaken diagnosis of "cold abscess" she had been treated on a spinal splint in a union infirmary for ten months, eventually being discharged as "improved." During this time a labour had been induced at 32 weeks in view of the obstruction caused by the "abscess." Soon after her discharge a swelling appeared in the inner side of the right buttock near the anus. This was the lower pole of an elongated, soft swelling which extended as high as the finger could reach and encroached on the vagina. The hip, spine, and sacro-iliac joints were all found normal and pelvic lipoma diagnosed. The specimen was easily removed in one mass through a 2½-inch incision over the swelling in the buttock, and proved to be a typical true lipoma, hour-glass in shape; the upper lobe, 3 in. long, was flattened, the isthmus, 1 in. by ¾ in., had been behind the pubic arch, and the lower lobe, 3½ in. long, was rounded.

Prof. BLAIR BELL (Liverpool) showed two specimens: (1) Sarcoma of the uterus removed from a single woman aged 61; the menopause had occurred at 50. For seven months there had been slight irregular bleeding from the uterus, which was enlarged; for the last month the bleeding had been almost constant and there had been a little pain. Pieces removed at an exploratory curettement on April 15th, 1923, showed the growth to be a spindle-celled sarcoma; panhysterectomy with removal of both appendages and the vermiform appendix on April 28th, 1923. (2) Cystic sarcoma of the left ovary. This occurred in a II.-para aged 55, ten years after the menopause. Slight abdominal pain had been present for six months. On Dec. 4th, 1923, there was dysuria followed by the sudden onset of severe abdominal pain. The attacks of pain varied in severity, gradually becoming more severe and causing vomiting. On examination there was slight abdominal distension; a hard mass, apparently rising out of the pelvis, was palpable in the left iliac fossa; there was a large cystic swelling in the pouch of Douglas pushing the uterus forward. On Dec. 17th panhysterectomy with removal of both appendages and appendicectomy; the solid portion of the ovary had to be separated from its adhesions to the brim of the pelvis and left iliac fossa. Section showed the solid portion to be a mixed celled sarcoma.

Dr. LEITH MURRAY and Prof. ERNEST GLYNN (Liverpool) showed a rare specimen of diffuse fibromyomatous overgrowth of the uterus. The patient, a woman aged 31, menstruated regularly since marriage a year and a half before; but she had experienced an abdominal swelling and pain "for some months." Complete hysterectomy was performed. The body of the enlarged uterus measured 6 in. long, 5½ in. broad, and 6 in. antero-posteriorly. It was uniformly studded with nodules of fibromyomatous overgrowth which formed irregular bosses under the peritoneum. The nodules were whorled and not encapsulated. The cervix was normal. The uterine cavity was considerably enlarged but the mucosa normal. Microscopical sections of seven pieces of the uterus showed an ordinary fibromyomata and no trace of adenomatous tissue. There were, however, several small groups of young and proliferating blood-vessels like those in a capillary nævus. The specimen resembled almost exactly one figured by Cullen and described as a "general myomatous tendency" of the uterus. It was suggested, however, by the exhibitors that the term "fibromyomatosis" was more in keeping with pathological usage. The ending osis was frequently employed to describe diffuse proliferation of a neoplastic type in various connective tissues—e.g., lipomatosis, fibromatosis, neurofibromatosis, myelomatosis. The pathology of the tumour was unexplained, but it was probably in some way associated with the vascular proliferation.

Dr. D. DOUGAL (Manchester) described a case of ovarian dermoid ruptured during labour and expelled per rectum a month after delivery. The patient was a primigravida, aged 28, medium pelvic contraction. She was admitted 48 hours after the onset of labour and after forceps failure at home. Easy extraction after perforation; the prolapse of anterior rectal wall noted at the time was ascribed to the previous forcible attempts at delivery. On the fourth day pyrexia, abdominal pain, distension, and vomiting; condition critical, temperature reaching 104° F.; after a fortnight a piece of bone was felt through an opening in the anterior rectal wall; a fortnight later a necrotic piece of the tumour including the plate of bone and dermoid process was passed per rectum. She was discharged two months after the labour and is now in good health.—Prof. H. BRIGGS suggested that the tumour might be a para-rectal and not an ovarian dermoid, and Dr. DOUGAL agreed.

Prof. GLYNN, recently assisted by Dr. Morris Cohen, summarised his observations on

Forty Autopsies upon Pulmonary or Cardiac Embolism

and upon primary pulmonary thrombosis. Almost invariably the lungs had been hardened and dissected, the various thrombi in them drawn and then examined microscopically. The main conclusions were: 1. Death usually occurs in either embolism or thrombosis in from 10 to 20 minutes. The development of primary thrombosis was often suggested by a slight rise in pulse-rate without a corresponding rise in temperature. 2. Primary pulmonary thrombosis was much more frequent; death occurs in post-operative cases about the tenth day. In 35 consecutive post mortems, 28 being on post-operative cases, 4 were due to embolism, 30 to primary pulmonary thrombosis, and 1 doubtful. In another case, primary thrombosis and embolism were combined.

The main evidence for primary thrombosis was: 1. The presence of proved ante-mortem thrombi, usually in both lungs and in all lobes, which could not possibly have developed in the few minutes elapsing between the acute onset and death. 2. The presence of age changes in the pulmonary thrombi, demonstrated by (*a*) hæmolysis; the blood pigment was deposited not only in the thrombi but often in the walls of the pulmonary arteries surrounding them, and even in the bronchial cartilages; and (*b*) commencing organisation of some thrombi which occurred in about a third of the cases.

The main causes of primary thrombosis were: 1. Mild sepsis, demonstrated by the frequent very slight pyrexia, and by the frequent occurrence of a non-hæmolytic streptococcus in the thrombi. 2. Pulmonary stasis, for the patients were invariably bedridden. The danger of the latter could be greatly diminished by encouraging patients to practise movements and deep breathing as soon as possible after operation. At the Liverpool Royal Infirmary from 1905 to 1915 there were 9 autopsies upon primary pulmonary thrombosis (post-operative) from the gynæcological ward, and 7 surgical (post-operative) and 3 medical from the rest of the hospital; from 1916–23 there were 2 (post-operative) from the

gynæcological ward, 6 surgical (post-operative), and 3 medical from the rest of the hospital. The diminution in the number of gynæcological cases coincided with the introduction by Prof. Blair Bell of systematic deep breathing and active arm exercise, practised every morning from the third or fourth day after the major operation. No such exercises were practised in the rest of the hospital.

CARDIFF MEDICAL SOCIETY.

A MEETING of this Society was held on Feb. 12th, Dr. R. CAMERON being in the chair.

Dr. E. COLSTON WILLIAMS read a paper on

The Relations of the Private Practitioner with the Public Health Services.

He contrasted three points of view: that of the general practitioner, who is engaged mainly in curative medicine and who views his work from an individualistic standpoint; the local authority that is required to perform duties in providing treatment with due regard to economy and efficiency; and the view of the medical officer of health, whose endeavour is to organise treatment services within the limits of expenditure allowed, and who must take a general view of the problem. In tracing the rapid change from the environmental standpoint of public health to the new preventive view, which deals with the individual from birth through infancy and childhood into adult life, he pointed out that a certain broadness of outlook and social interest was necessary in all those members of the profession who were in any way associated with modern preventive medicine, and now that there was growing unity throughout the profession, that still closer relations were possible between the practitioner and the organisation of preventive services in all forms. The cordial coöperation of the general practitioner in the tasks of prevention was essential for success. The ante-natal clinic, the school clinic, and the venereal disease clinic were unable to deal with more than a small fraction of the problems for which they were created, and competent private practice must bridge the gaps. If the Insurance Act was to attain its fullest usefulness, it must be by allowing the practitioner to work under such conditions as would enable him to give his best service, fully assisted by all possible scientific aids to diagnosis and treatment. Other points of importance dealt with were medical assistance rendered under the terms of the new Midwives Act, responsibility in the administration of isolation hospitals, the relation of the practitioner to the tuberculosis service, and what might be the desirable lines of evolution of the Public Health Laboratory. Many difficult problems in relation to voluntary hospitals were arising which the profession seemed somewhat loth to tackle—for example, what was to be the status and remuneration of staffs, whether work and payment for work for public authorities should be accepted, and, if so, what terms would be satisfactory to the profession?

Mr. J. BERRY HAYCRAFT gave a demonstration on

A Simple Method of Performing Blood Transfusion.

He pointed out the various indications, and emphasised the importance of employing a method that could be simply and rapidly performed, owing to the frequent urgency of these cases, and the fact that they had only occasionally to be dealt with. The operation was divided into two stages: (1) The selection of the donor. Two methods of performing the agglutination tests were described. If type II. and III. sera are not available, the direct action of the recipient's serum on the cells of the donor is tested. (2) The transfusion is performed using a 3·8 per cent. solution of sodium citrate as an anticoagulant. The donor's blood is received into a graduated jug containing the solution, and the transfusion performed with an ordinary saline infusion apparatus, the veins being cut down upon and glass cannulæ employed. The citrate solution was in two graduated flasks contained in drums which were sterilised, so that they could be kept indefinitely, and the whole apparatus was made in convenient portable form by Messrs. Staniforth of Cardiff. It was pointed out by this means transfusion could be employed anywhere, and it was not necessary to send patients long distances to a large hospital. In injuries to the limbs transfusion should be employed prior to operation, whereas in abdominal hæmorrhage laparotomy should be performed first, and the transfusion commenced immediately the hæmorrhage is controlled.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society on Feb. 26th, with Sir DAVID WALLACE, President, in the chair, Mr. DAVID LEES opened a discussion on

CONGENITAL SYPHILIS.

He began by sketching the historical facts regarding the hereditary transmission of syphilis, and went on to discuss the method of transmission of infection, concluding from his own experience that maternal syphilis was most commonly the cause, infection being by the placental route. With regard to Colles's law, he said that the blood of over 90 per cent. of the mothers exhibiting the apparent paradoxical immunity showed a positive Wassermann. Maternal syphilis had a more profound effect on heredity than paternal, and the virulence was more marked still when both parents were affected. The more recently infected the mother before conception the more virulent was the course of the disease in the child; the older the infection the less marked was the effect of parental transmission. Up to the eighth month of pregnancy the virus might be transmitted to the child in utero. Subsequent to this the infection was more probably acquired during its passage through the maternal passages at birth. The virulence of transmission lessened with time, and in the fifth and sixth year of untreated syphilis the infection might no longer be transmitted. Cases were quoted by Fournier, however, of transmission up to the twentieth year. Treatment had a profound effect in lessening the virulence of heredity, and active specific treatment of the mother during pregnancy could almost eliminate it.

Rietschel considered that the modified course of the disease in the mother was due to the uterus being an unsuitable medium for the spirochæte. This theory was supported by the experimental work of Neisser. More recently Routh had attributed the attenuation of the virus to spirillolysis set up by the chorionic ferments. While the spirochæte was subject to the influence of the ferments the syphilis was quiescent, and subsequent to pregnancy redeveloped and resumed its former activity. Toxic symptoms during pregnancy were more marked when the infection was acquired at or near conception. Congenital syphilis was generalised from the beginning, and consequently had a more profound effect on general nutrition, and so on mental and physical development.

Diagnosis.

In diagnosis, Mr. Lees said, careful inquiry into the possibility of acquired syphilis in both parents should be made, and as to a history of miscarriages on the part of the mother. The early history of other children and examination of them was often helpful. Spirochætes could be demonstrated in the serum expressed from the margin of active skin lesions. In spite of this, contagion from congenital syphilitic children was rare. The Wassermann test was positive in well over 90 per cent. of cases with active lesions, being practically 100 per cent. in cases showing gross lesions at birth. The provocative Wassermann was often useful in doubtful cases. Mr. Lees referred at some length to the luetic test, considering that it should only be employed as

supplementary to the Wassermann test. The so-called therapeutic tests should only be employed when more accurate methods had failed. Many non-specific skin lesions were benefited by arsenic and mercury.

Clinical diagnosis was discussed at length. Both in early and late congenital syphilis the lymph glands tended to be involved and super-added tuberculous infection was not uncommon. Iritis occurred early, and with it there was often an accompanying cyclitis. Interstitial keratitis, rare in infancy, was common from the eighth to the fifteenth year. Mr. Lees referred to the wide variations of the clinical picture, and said that in no pathological condition was it so important to avoid looking at the body in compartments. He referred to the predisposition to intercurrent lesions, and to the simulation of other conditions by congenital syphilis, stressing the importance of considering it as a possible ætiological factor in apparently intercurrent disease. He quoted Kolmer's maxim, "Always suspect syphilis, but be slow to diagnose it."

Prophylaxis and Treatment.

Discussing prophylaxis, Mr. Lees said that the first principle was the intensive treatment of all cases of acquired syphilis until a clean bill of health had been given to both parties. In the married prevention of conception must be insisted on until all clinical evidence of disease had disappeared. If conception had already taken place intensive treatment of both parents, and especially of the wife, was essential. It should be instigated early and continued to a week before term. Arsenic was the most potent drug, and was usually well tolerated by the pregnant woman. Any of the "914" preparations might be given. Joint exhibition of arsenic and mercury in pregnancy might produce excessive strain on the already burdened kidney. The drugs should, therefore, be given separately. Neo-natal treatment in all cases should be begun at the earliest possible moment within a few hours of birth. Mr. Lees recommended "dribble" doses of the arsenical drug daily or on alternate days as the safest and most satisfactory method. The intravenous route was preferable for rapidity of effect in the first or second dose, but subsequently intramuscular sulpharsenol was most satisfactory. When the gross lesions had disappeared mercurial therapy was commenced in conjunction with sulpharsenol. Bismuth had recently been used in congenital syphilis with good effects. Increase of body-weight was the most useful criterion of success after the gross lesions had disappeared. The minimum period of treatment was two years, and it could not be any less in any case of congenital syphilis, no matter how slight. In many others much longer periods were essential, according to the reaction of the patient to the therapy exhibited.

Discussion.

The PRESIDENT drew attention to the importance of clinical symptoms in diagnosis.

Dr. LEONARD FINDLAY, of Glasgow, who was present as the guest of Dr. John Thomson, gave an interesting account of his experience of congenital syphilis at the Ruchill Fever Hospital. He considered that the incidence had been grossly exaggerated. He believed that Fildes's figure of 0·5 per cent. of children in hospital classes was probably about correct. He showed several slides, giving statistics supporting his views. He believed strongly in the Wassermann test.

Prof. B. P. WATSON discussed the Wassermann test in new-born children, and pointed out how the presence of Wharton's jelly in cord blood rendered fallacious the results of the test.

Dr. J. V. PATERSON said that he now scarcely considered it necessary to do the Wassermann test, which he regarded as most reliable, in cases of interstitial keratitis. He had been very chary of salvarsan in the early days, but now used it always with benefit.

Dr. J. S. FRASER said that in his experience congenital syphilitic ear disease was not benefited by arsenical therapy.

Prof. G. M. ROBERTSON said that he had been struck lately by a feature of both interstitial keratitis and general paralysis of the insane—namely, the delay in their appearance in the course of the disease—and suggested anaphylaxis as a possible explanation. He asked whether there was not a natural tendency to cure in untreated syphilis.

Dr. J. H. GIBBS showed some lantern-slides illustrating Moon's molars with the typical doming of the cusp.

Mr. SCOT SKIRVING asked if there had ever been discovered any difference, culturally or otherwise, between the spirochæte of congenital and acquired syphilis.

Mr. C. W. MACGILLIVRAY spoke of cases in the pre-Wassermann days which had apparently recovered with purely symptomatic treatment.

Colonel GLEN LISTON spoke of the sigma test, and said that in a large series of cases he had found 29 per cent. negative Wassermanns positive to that test.

Mr. LEES replied to the various points.

Dr. R. CRANSTON LOW then showed a case of urticaria pigmentosa of 30 years' duration, and Mr. W. J. STUART one of facio-hypoglossal anastomosis.

MANCHESTER MEDICAL SOCIETY.

A MEETING of this Society was held on Feb. 6th, Dr. E. M. BROCKBANK, the President, being in the chair.

Dr. G. J. LANGLEY read a paper on the

Treatment of Auricular Fibrillation.

He first dealt with the necessity for an appreciation of the functional pathology of the condition. With regard to the different methods of treatment, the aim of the digitalis treatment was to produce heart-block, whilst the aim of quinidine treatment was to terminate auricular circus movement. Dr. Langley dealt with the ordinary method of digitalis administration and Eggleston's massive digitalis method. An analysis of the results of 50 cases treated by digitalis given by the ordinary method was discussed. With regard to the literature of quinidine treatment 1006 cases had been already collected, and now 441 further cases were added, with the results and dosage. Twenty-three cases that had been treated and the results obtained were described.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 19 cases were considered and £226 voted to 17 applicants. The following is a summary of the new cases relieved:—

L.R.C.P. & S. Edin., aged 61, who practised in Bristol. Applicant broke down in health four years ago, necessitating several severe surgical operations from time to time. He can only manage part-time assistantships or light locum work. Voted £26 in 12 monthly instalments.

Daughter, aged 53, of F.R.C.S. Edin. who practised in Birmingham. Applicant is one of 12 children, her father died when she was 18, and her mother six years ago. The mother's income was an annuity. Applicant has been crippled with neuritis and unable to work for three years. Now slowly improving, but the light work she is able to manage is not sufficiently remunerative to live upon. Her income last year amounted to £45. Voted £12 in 12 monthly instalments.

Widow, aged 37, of L.R.C.P. Edin. who practised in Wales and Canada and died at sea in November, 1923, on the return journey from Canada. The practice was the only source of income, and applicant is left with four children, ages 6 to 16 years, and the estate is not expected to realise more than £100 per annum. Applicant asks for educational assistance. Committee made a small grant to render applicant eligible for the Guild to investigate the case.

Three children, aged 9 to 14 years, of M.B. Aberd. who practised in Leeds and died in 1915. The mother married again, and has now lost her second husband, who was a metallurgist, before he was able to make any provision for her or his step-children. The mother asks the Fund to help with education. The children have £5 per annum each from the grandfather's estate. The Committee made a small grant so that the Guild will be able to investigate this case.

Subscriptions may be sent to the Honorary Treasurer, Sir Charters Symonds, K.B.E., M.S. at 11, Chandos-street, Cavendish-square, London, W 1.

Reviews and Notices of Books.

PHYSIOTHERAPY TECHNIC.

A Manual of Applied Physics. By C. M. SAMPSON, M.D., formerly of the Physiotherapy Service, Walter Reed U.S. Army General Hospital, Washington, D.C. London: Henry Kimpton. 1923. Pp. 443. 30s.

THIS book has been written in order to indicate the therapeutic value of various physical forms of treatment—viz., high frequency and diathermy, static electricity, actinotherapy, X rays (for non-malignant conditions); galvanic, faradic, and sinusoidal currents; massage and hydrotherapy. The largest sections of the book deal with diathermy, ultra-violet radiation, static electricity, and X rays. Shorter sections deal with the other physiotherapeutic agents, and there are special chapters devoted to the treatment by physical means of arthritis, locomotor ataxy, genito-urinary diseases, and hay fever. The book is dedicated to the "therapeutic peptimist," whom the author describes as the optimist who envisions much better things than are even now possible, and has the determination, courage, ability, and energy to go out and make his visions come true. The "peptimist" is the antithesis of the therapeutic nihilist.

The author has evidently had considerable experience of the subject on which he writes. He says that practically each step in every technique given in the book is based upon laboratory and clinical research, and that the results have been checked by others, who were by no means prejudiced in favour of the methods. He insists on the necessity of correct technique, and frequently emphasises his descriptions with instances in which the failure to pay attention to detail has resulted in the depreciation of the value of physiotherapy. For the application of diathermy the author describes a sedative and a stimulating method. In the latter only the gentlest degree of heat is applied, and the method is employed for the stimulation of the growth of sluggish tissues as, for example, in the treatment of ununited fractures. He speaks highly of diathermy for the treatment of paralysis due to nerve injury, and says that surgeons have often called attention to the fact that adhesions are much less firm and more easily removed in cases which had been subjected, before operation, to courses of diathermy.

The book is amusing to read in many parts. When speaking of the inability of the shocks from the static machine to do harm, the author describes how he discovered an arthritic mouse among a colony, and proceeded to give it the regular static treatment for arthritis. Its improvement was manifest from the time the first spark hit it, and during the 12 days of subsequent observation it covered more mileage, ate more food, and generally was more lively than any of the untreated controls. Certain statements are open to criticism. It is difficult to see how a heavy condenser discharge (preceded by heat) can "break up and squeeze out into the dilated blood and lymph spaces the semi-organised and organising inflammatory exudate." The graphic record of the sinusoidal current is incorrectly figured and described.

The book contains much useful information, and the results described should stimulate other workers to try the author's methods. A form of treatment for hay fever is said by the author to "come near being specific. It consists first in the application of high frequency; second, in the application of ultra-violet rays to the anterior nares; third, in the application of the same rays to the posterior nares and naso-pharynx." The volume is well prepared and fully illustrated. There are some useful diagrams, but many of the illustrations are pictures of patients receiving treatment, and these add to the bulk of the book without contributing much to its value.

DIABETES.

New Views on Diabetes Mellitus. By P. J. CAMMIDGE, M.D. Lond., and H. A. H. HOWARD, B.Sc. Lond. Oxford Medical Publications. London: Humphrey Milford. 1923. With 85 figures. Pp. 611. 21s.

THE authors here set out in book form much of the work which they have published during the last few years in current medical journals. The opening chapter deals with normal carbohydrate metabolism and the shape of the blood-sugar curve after a dose of sugar or a mixed meal, the maximum point being placed after the third hour unless the patient has a hyperchlorhydria. This experience differs from that of many observers who find the maximum point at the end of half an hour or very little later. The authors have attempted to show that the acid secreted in the gastric juice affects the curve by producing changes in the acid-base metabolism of the blood and liver; these experiments are not convincing.

The experiments which deal with the source of the amylolytic ferment in the blood stand on a different plane; the hypothesis seems to be proved that this ferment is formed in the liver and not in the pancreas though the latter organ controls its output. The effects of prolonged boiling on oatmeal and of long toasting of bread have been investigated, and the conversion of a certain proportion of the starch into dextrin is demonstrated. The authors are able to confirm Pavy's observation that dextrin is used in a different way from starch. The experiments on the amylolytic ferment and the increase in the amount of sugar in the blood after hydrolysis (called the difference value) have been used by the authors to sort out the different types of diabetes. One-third of the patients show changes which resemble those which occurred in the dog whose pancreas had been partly removed; one-third show changes which resemble those seen in a rabbit whose liver has been damaged; while the remaining third show changes which are not characteristic of either group and may be due to a combination of the two causes. This evidence is opposed to the views of Allen and others who believe that the pancreas is primarily involved.

In the chapter on the principles of treatment 34 pages are devoted to the treatment with insulin. From internal evidence it seems that this represents only the early observations of the authors, and no reference is made to work published after May, 1923. Experiments made on two severe cases of diabetes are described and the results compared with Mackenzie Wallis's unstandardised extract. In one case only did this extract cause a definite fall in the blood-sugar, while insulin always caused a fall, unless much carbohydrate was given, and a corresponding improvement in the clinical condition. In one case insulin was discontinued, as no further improvement seemed to be occurring, although great improvement had taken place, and the boy died some two months later. The authors express the view that to give two injections a day to a boy of 14 for the rest of his life is a somewhat appalling prospect. They hesitate to accept the view that insulin stands in the same relation to diabetes mellitus as thyroid extract does to myxœdema. "for the pancreatic factor is not present or dominant in every case of diabetes as a deficiency of the thyroid is in myxœdema." The statement that in some respects the action of insulin is more akin to the relief of pain by a dose of morphia, is remarkable in the light of the work of other observers in Canada, the United States, and this country. With regard to the principles of dietetic treatment the authors also stand in opposition to modern views, since they do not hesitate to give much larger amounts of carbohydrate than are usually given and their fat ration is very low. If the patient can be kept sugar-free so much the better, but if not they think that it is better for him to pass sugar than to have the carbohydrate ration reduced too much. The authors' work on the effect of atropine and morphia on the shape of the

blood-sugar curve is interesting; they think that some patients can be helped in this way.

The book represents an enormous amount of laborious work. It contains many diagrams which make the text more easy to understand and a good list of references at the end of each chapter will be useful to other workers. The fact that some of the views expressed are at variance with those of other workers justifies their collection within the covers of a single volume.

The Treatment of Diabetes Mellitus. With Observations Based upon 3000 Cases. Third edition. By ELLIOTT P. JOSLIN, M.D. Harvard, Clinical Professor of Medicine, Harvard Medical School; Consulting Physician, Boston City Hospital. London: Henry Kimpton. 1924. Pp. 784. 36*s*.

IN the third edition of his well-known book Prof. Joslin has added a new section on insulin, his attitude towards which is contained in the words: "Insulin does not cure diabetes, but it is a priceless gift to the severe diabetic provided that he be intelligent and faithful." The section opens with a history of the discovery of insulin by Banting and Best, and of the work of numerous others who showed that extracts of pancreas had an effect on the metabolism of sugar, or who were at all events very near the discovery. This makes very interesting reading. The next 60 pages give the results of insulin treatment for one complete year, starting from August, 1922. These have been uniformly good apart from some definite cause, usually the fault of the patient or the intercurrence of other disease. The treatment is very carefully explained; minute details are given as to the best way of keeping the syringe and performing the injection.

"It is a mercy," writes Prof. Joslin, "that at present insulin becomes inert when given by mouth and that its present use is restricted by syringe," explaining this strong statement on the ground that insulin is a most potent remedy from which untold damage might occur if it was used indiscriminately. In one respect the author has changed his standpoint, since he now says that it is important to keep not only the urine sugar-free but also to keep the blood-sugar normal. He thinks that patients should not gain weight unduly. During this first year 20 died out of a total of 293 insulin-treated patients. In only five is the cause of death given as coma and one of these was complicated by tuberculosis; some of the others were admitted in the late stages of coma; the remaining 15 all died of intercurrent affections.

No mention is made of any work on insulin done in England, although several papers were published before August of last year and this omission is apparent throughout the whole book. English workers on this showing would seem to have contributed nothing to the advance of our knowledge. The remainder of the book follows the lines of previous editions; the pages on incidence and ætiology are full of interesting information. A statement by Sherrill is quoted with approval, "that functional deterioration in diabetes can be traced to definite causes, particularly infectious and dietary excesses, that downward progress clinically depends upon the different susceptibilities of different patients to these injurious influences, and that by strict avoidance of such influences downward progress can be largely or wholly avoided." The section on pathology is hardly worthy of the rest of the book. Renal glycosuria is dismissed in two pages. Dietetic treatment is adequately dealt with in 140 pages, considerable space being given to the desirable relationship between protein, fat, and sugar. A section entitled, "What every patient should know," is very clear and well devised; 28 pages devoted to the composition of foods will be very useful to the physician who is called to answer the sensible questions of intelligent patients.

Prof. Joslin's book is packed with interesting information about diabetes and is well written. It is so readable that the author may be forgiven for being at times too discursive.

THE OFFICIAL HISTORY OF AUSTRALIA IN THE WAR, 1914–1918.

Vol. XII. Photographic Record of the War. Sydney: Angus and Robertson. 1923. Pp. x.-753 and Index. 28*s*.

THE photographs reproduced in this volume were taken by the Australian official photographers, Capts. G. H. Wilkins, *M.C.*, and J. F. Hurley; Lieuts. H. F. Baldwin and J. P. Campbell and others, while the preface and annotations are supplied by Mr. C. E. W. Bean and Mr. H. S. Gullett. It aims at supplying a complete authentic pictorial narrative of the effort of Australia in the war, and although the begetters of the work do not say whether their aim has been fulfilled or no, we ourselves may affirm that the book is of extraordinary interest. We have pictures of scenes in Australia on the outbreak of war, of the starting of the troops, of the Royal Australian Navy and the Mercantile Marine, and of the raising of the Australian Imperial Force. Plates 15–19 give views of the *Sydney—Emden* fight, the last one being a picture of the sorely-battered *Emden* after surrender. In the rest of the book we have pictures from all other fronts. An inspection of Plates 219–231 or 267 and 268 should make clear the anxiety of France to obtain reparations. Plates 219 and 220 show a clean comfortable little village street, while Plate 221 shows a series of rubble heaps, but it is the same place. Many photographs were taken in the Palestine operations, all of which are of much interest, one very notable one being 627, the Jordan Valley from the air. Altogether the volume is in every way a worthy companion for its narrative fellows.

MIND AND HEREDITY.

By VERNON L. KELLOGG. Princeton: University Press. 1923. Pp. 108. 7*s*.

"MIND" is possessed by all animals—possibly plants too. The instinctive and most elaborate reactions of insects show no obvious signs of being subject to what we should call intelligence, but some of the lower animals—rabbits, for example—give unmistakable evidence of having, in a small degree, the capacity for thought and choice which some people have supposed to be man's prerogative. The instinct mind is wholly inherited and owes nothing to environment. A great deal, at any rate, of the human mind is inherited too, and it is certainly not in mental capacity that all men were created equal. Environment has its share in education, but educational systems overlook too much the predominant differences in natural intelligence. Such in outline is the substance of these pleasant lectures, which will stimulate the reader to think rather than tell him what to believe.

INTERNATIONAL CLINICS.

A Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles. Vol. III. Thirty-third Series. London and Philadelphia: J. B. Lippincott Co. 1923. Pp. 312. 42*s*.

WE take occasion to remind readers of this serial potpourri of medicine and surgery, edited by Dr. Henry W. Cattell, with the collaboration of numerous specialists. Sections of this publication are devoted to (1) diagnosis and treatment, (2) morbid psychology, (3) pædiatrics, (4) medicine, (5) surgery, and (6) the medico-legal aspect of death by hanging, and the present series contains altogether two dozen papers. The titles of some of these show what a wide field has been covered. The first paper is on the Treatment of Allergic Diseases, by W. Storm van Leeuwen, of Leiden; some way down the list there is a paper on What Can and What Can Not be Done to Prevent Falling of the Hair; in another paper arguments are adduced to show that cancer is never a purely local disease; another deals with thyroid therapeutics. In the pædiatric section the interesting problem of *Bacillus coli* infection in childhood is dealt with. Volumes of this kind are hardly suitable for medical students,

but for the reader who is more free to choose his literature such a work has many attractions. The editor has picked his staff with an eye not only to their knowledge, but also to their capacity for passing it on to others in a digestible form. The pictorial style when handled skilfully may be a valuable aid to memory. In his paper on Thyroid Therapeutics Dr. William N. Berkeley writes: "When thyroid is properly given, I have seen half a dozen teeth sprout in a backward baby's mouth in three weeks' time, like tulip bulbs in warm spring weather." Touches such as this brighten a medical work.

COMMON SYMPTOMS OF AN UNSOUND MIND.

A Guide for General Practitioners. By G. RUTHERFORD JEFFREY, M.D. Glasg., F.R.C.P. Edin., Medical Superintendent, Bootham Park Mental Hospital, York. With a foreword by Sir JAMES CRICHTON-BROWNE, M.D. Edin., F.R.S. London: H. K. Lewis and Co., Ltd. 1923. 7*s.* 6*d.*

Dr. Jeffrey has performed a considerable service to the profession in publishing his short manual on the common symptoms of mental disorder. He deals exclusively with the external features of mental disease; each common symptom is considered in the light of its possible significance. A chapter is devoted to each of five main groups, delusions, disorders of perception, disorders of conduct, excitement and depression, and confusion. The discussion of their significance in relation to the other factors of a given case is illuminating and readable, and is illustrated by vivid accounts of many actual cases. Among these the reader will be puzzled to find no less than three ladies who were 61 years of age, two of them with cerebral tumours, described on adjoining pages. Dr. Jeffrey has strong views on the question of legal responsibility, and a chapter is devoted to this subject. The only missing feature is a discussion of the indications for certification, and of measures necessary and feasible when certification is delayed or impracticable. Such a chapter would add to the usefulness of a book which will in any case prove of great value to the general practitioner.

PRACTICAL ANALYSIS OF BLOOD.

Second edition. By VICTOR CARYL MEYERS, M.A., Ph.D., Professor and Director of the Department of Biochemistry, New York Post-Graduate Medical School and Hospital. London: Henry Kimpton. 1924. Pp. 232. 25*s.*

IT is difficult nowadays to realise that the first clinical estimation of any blood constituent was introduced by Bang as recently as 1913, and that the science of clinical blood analysis really started at this date. Previous to this period the methods in use required such enormous quantities of blood that they were quite impossible clinically.

The volume under consideration is already well known as one of the standard works on the subject, and is used extensively in America. Unfortunately English clinicians are only just beginning to realise the importance of blood analysis, hence the demand for such a work is not so great in this country. The book is extremely well arranged, and the illustrations are numerous and good. A very wide choice of methods is given, and the author has modestly refrained from emphasising his own particular techniques. There are, however, several points to be noted. First, we would ask, Why do writers copy mistakes and misprints (and they are very great) when describing Folin's and Wu's methods? The perpetuation of these errors leads workers who try the methods to condemn them, whilst in reality the Folin system is undoubtedly excellent. A second point is that the reader does not obtain a clear appreciation of the clinical value of the results of the analyses he has been told to perform. The information is more of a technical than a medical type, with the result that the vast practical value of the determinations is lost sight of. A pleasing thing is the chapter on blood uric acid, and most especially, the detailed description of Sir Alfred Garrod's monumental work on the subject nearly 75 years ago. It is, indeed, a pleasure to find a modern text-book which brings such names to the fore as A. B. Garrod and Carl Schmidt, the famous professor of physiological chemistry at Dorpat.

On the whole, the book is very good, and it is to be hoped that it will have a large circulation in England, and that workers over here will take to heart the doctrines that the author so eloquently pleads.

JOURNALS.

BRITISH JOURNAL OF SURGERY.—The January number contains the eleventh of Sir D'Arcy Power's series of Eponyms, Bell's Palsy.—John Fraser's contribution to the discussion on Operation Shock at the sixth meeting of the International Society of Surgery is reproduced in full. He reviews the theories held up to the end of 1915, and discusses the result of war researches upon this subject, and finally comes to some interesting conclusions. There follows an account of the discussion on the subject.—J. J. Levin and A. Porter report four cases of intestinal obstruction due to an accumulation of large numbers of *Ascaris lumbricoides*.—J. Fraser and N. M. Dott record their experimental results in a new method of performing aseptic intestinal anastomosis. The detail of technique, which is new, is their method of dividing the occluding ligatures on the cut ends of the gut by a special instrument which they call their ligature guillotine.—Sir Arthur Keith, in his eleventh Mitchell Banks memorial lecture, deals with the origin and nature of hernia. He describes the factors which may produce sacs of developmental origin, and also the mechanism whereby sacs may be acquired in later life.—H. J. Waring and H. E. Griffiths, in reporting 15 cases of acute pancreatitis, analyse the symptomatology, diagnosis, pathology, and treatment of this condition.—R. Hamilton Russell describes his special method of obtaining extension in cases of fractured femur. His main contention is that some flexion of the knee is essential to correct alignment, and he maintains that his method gives not only good results but much comfort to the patient.—R. J. Gladstone and C. P. G. Wakeley analyse the relative frequency of the various positions of the vermiform appendix, judged from 3000 examinations.—P. Sargent brings forward some points in the surgery of the pituitary gland. He reports his cases and describes his operative methods, which are based on Frazier's original operation.—Naughton Dunn and F. W. Stuart record two cases in which the tensor fasciæ femoris muscle has been used as a transplant in cases of paralysis of the quadriceps muscle.—H. Platt and W. R. Bristow publish an exhaustive paper on the remote results of operations for injuries of the peripheral nerves. They conclude that end-to-end suture alone holds out good promise, and even with this method at least 20 per cent. failures are to be expected. Certain nerves are dealt with separately and their percentage recovery given.—This paper, being a contribution to the discussion on that subject at the International Society of Surgery, is followed by a critical summary of the discussion.—D. P. D. Wilkie reports a case of paralytic ileus treated by a high and a low enterostomy. The drainage from the upper jejunal tube was so profuse as to prejudice the result from loss of body fluids. The two tubes were therefore joined up outside the abdomen, and the bowels were opened naturally. The two fistulæ closed rapidly when the tubes were removed.—An account is given of a visit to the Professor Thorkild Rovsing and the Rigshospital at Copenhagen.—The following rare or obscure cases are recorded: (1) G. Hadfield, malignant papilloma of the renal pelvis associated with calculus; (2) D. Wood and C. S. Gideon, two cases of fatal hæmatemesis after splenectomy for Banti's disease; (3) C. J. Marshall, perforation of the stomach by a needle, being one of many metallic foreign bodies present in that organ; (4) T. Twistington Higgins, subacute pancreatitis occurring in association with acute intestinal obstruction in a new-born infant.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

VIII.—STARTING A PANEL PRACTICE.

BY LEONARD SHOETEN SACK,
OF THE MIDDLE TEMPLE, BARRISTER-AT-LAW; JOINT AUTHOR OF "MEDICAL INSURANCE PRACTICE."*

"Men are everything; measures are comparatively nothing."

MUCH can be said either for or against any system of compulsory health insurance controlled by the State, and there is still greater scope for argument when considering the particular system which was established in this country in 1911 under the National Health Insurance Act. With the merits or demerits of that system we are not here concerned. For the purpose of our present subject it is sufficient to stress the fact that there are to-day more than 15 million people in this country who are compulsorily insured, and who, with few exceptions, seek and obtain their medical attendance and treatment only from panel medical officers.

This figure would, by itself, indicate that the treatment of insured persons is a matter which the average doctor about to start in general practice cannot afford to disregard. But the influence of national insurance extends farther. The normal family does not employ two medical men. Even in these days of revolutionary tendencies, the "family doctor" remains a very real and popular conception. There may be only one insured person in a family of four or five, yet the "panel doctor" who is chosen to look after him will almost invariably be sought when the non-insured members fall ill. Whether for good or for evil, the doctor who is starting in practice will, with rare exceptions, be virtually compelled to choose between undertaking insurance practice or being satisfied with a greatly restricted private practice. It is not surprising, therefore, that there are more than 15,000 panel doctors in the British Isles, and that this number is increasing.

Preliminary Steps.

In the administration of medical benefit under the National Insurance Acts the controlling authority does not, as in the case of most other public health services, select the doctors by whom the service is to be carried out. Every qualified medical practitioner—that is to say, every doctor whose name appears on the Medical Register—is entitled as of right to treat insured persons. Moreover, the insurance practice cannot be terminated without the consent of the doctor except for some very grave offence, and then only after a special inquiry by the Minister of Health.

The method of entering insurance practice is simple. For the purpose of administering medical benefit, public bodies, known as insurance committees, are set up for each county and for the larger county boroughs. The members of these committees represent insured persons, doctors, chemists, and the local council. One of the obvious duties of the committee is to arrange for the necessary supply of doctors, and for this purpose it keeps a list of the names and addresses of the local practitioners who have undertaken to treat insured persons. This is the "panel"—officially known as the Medical List. A doctor undertaking insurance practice must first secure that his name is included on this list. To do this it is necessary only to send to the clerk of the insurance committee (whose address can be obtained from any post office) a notice in the following form.

FORM OF APPLICATION FOR ADMISSION TO MEDICAL LIST, NATIONAL HEALTH INSURANCE.

I, A. B., residing at ....., a duly qualified medical practitioner registered in the Medical Register in that name, and having the following medical qualifications, namely, ..., desire to undertake the medical attendance and treatment of insured persons in the area of the Committee upon the terms for the time being in operation in that area, and for this purpose I hereby accept service under those terms and apply for admission to the medical list of the Committee.

The district or districts within which I undertake to visit insured patients and particulars of my surgery hours are given below:—

District.	Surgery.	Days and Hours of Attendance.

Signed .....

Date .....

On receipt of this notice by the insurance committee, the doctor's name (assuming that it does, in fact, appear on the Medical Register) must be entered on the Medical List for the district, and the doctor *ipso facto* becomes entitled to treat the insured persons who apply to him. In practice, the clerk to the committee informs the doctor that his name has been placed on the list, and also furnishes him with a supply of the many forms which appear still to be inseparable from any State-controlled service—e.g., certificates, record cards, and prescription forms.

Conditions of Service.

Concurrently with the doctor's right to treat insured persons, there necessarily arise the duties and obligations which form part of the doctor's agreement with the committee. Before 1920 the doctor signed a contract which specified many of these obligations. Now there is no written form of contract, but the contractual relationship remains. It will be observed that the notice states that the doctor desires to treat insured persons "upon the terms for the time being in operation." These terms are mainly set out in the Medical Benefit Regulations, 1924. So far as the provisions of those regulations affect his insurance practice, the doctor is bound by them—they form part of his "contract." The part of the regulations most directly affecting the doctor (Schedule I., which includes the "Terms of Service" and the Medical Certification Rules) is issued by the insurance committee as a separate document. There are also two schemes prepared by the committee, one, known as the Allocation Scheme, applies the general requirements of the regulations on such matters as the provision of emergency treatment and the limitation of panel lists; the other—the Distribution Scheme—deals chiefly with remuneration.

It should be understood that when a doctor notifies the insurance committee that he wishes to treat insured persons, he thereby accepts the terms of service set out in the regulations and in the two schemes. He should, therefore, obtain copies of these documents from the insurance committee and should inform himself of their provisions before sending in his formal notice.

Duties Required.

It does not fall within the scope of this article to deal in any detail with the various obligations of the insurance practitioner. The principal services which the doctor undertakes to give to insurance patients may, however, be summarised in general terms as follows:—

1. The provision of general practitioner treatment to all insured persons on his list (excluding treatment in respect of confinements or attendance at miscarriages, but including the administration of anæsthetics or the provision of an anæsthetist).
2. The provision of emergency treatment to any insured person whose doctor is not, at the time, available.
3. The writing of prescriptions for necessary medicines and certain appliances on a special prescription form (in some cases the doctor must himself supply the medicines or appliances, at an additional rate of payment).
4. The issue of certificates. In all, there are five certificates of incapacity, one death certificate, and one voluntary certificate.
5. The keeping of records in respect of the diseases and treatment of all his insurance patients.

* A Work of Reference to the Medical Benefit Provisions of the National Health Insurance Acts. By R. W. Harris and L. Shoeten Sack. London: The Scientific Press, Ltd. 1922. Pp. 327. Price 7*s.* 6*d.*

The doctor undertakes to visit any patient whose condition requires it, and to provide proper and sufficient surgery accommodation for those patients who are well enough to attend at the surgery.

The insured person, on his side, is bound by certain rules which, inter alia, require him to obey the instructions of his doctor, not to make unreasonable demands upon his professional services, and not to summon him during the night except in cases of serious emergency.

Payment and Goodwill.

Except in Manchester and Salford, where an attendance system prevails, payment for insurance practice is made on the capitation basis. The Court of Inquiry recently appointed by the Minister has fixed the capitation fee for 1924 at 9*s*., and has recommended that this fee should continue until the end of 1927. It should be understood that under the capitation system of payment the Central Fund from which all payments are made is constituted by multiplying the capitation fee of 9*s*. by an estimated number of insured persons in the country. The Central Fund is then distributed among the insurance committees according to the number of insured persons calculated to be in each area by reference to the local committee's register. As the local registers do not provide a true count of the number of insured persons actually in the area at any given time, the doctor will not necessarily receive an amount exactly equivalent to the sum of the capitation fee multiplied by the number of insured persons on his list. Payment is made quarterly. Generally speaking, a doctor is not permitted to accept any fee from an insurance patient.

In addition the flat rate per head of insured persons on the doctor's list, there are certain special payments—e.g., in respect of anæsthetists' services and the treatment of temporary residents. Where a doctor is required himself to supply drugs and appliances, he receives an additional payment of 2*s*. a head, with special payment for certain expensive drugs and appliances, such as vaccines, insulin, &c. Doctors in rural areas also receive a "mileage allowance" where the patient resides more than two miles away, or where the country presents special difficulties of travel.

In considering the income to be derived from panel practice it must be remembered that, except under very special conditions, a doctor in single-handed practice is not allowed to have more than 2500 insured persons on his list. If assistants are employed he may be permitted to have an additional number, not exceeding 1500 for each assistant. Partners must not have more than an average of 2500, although any one partner may have up to 3000.

Goodwill in an insurance practice has never been officially recognised, although the principles are now largely the same as with private practice. A doctor buying a practice which includes a panel of insured persons cannot, of course, buy the right to treat all the insured persons who were on his predecessor's list, for every insured person is now able to change his doctor at any time. The regulations do, however, provide that the doctor who withdraws from the Medical List of an area may require the insurance committee to notify his insurance patients that his successor is willing to accept them on his list, and the incoming doctor receives for a limited period extra payment in respect of this undertaking to accept any of his predecessor's patients.

The Controlling Authorities.

The general relationship of the insurance doctor to the various bodies concerned in the administration of medical benefit can be indicated only briefly. The approved societies, as such, have no control. They are concerned primarily with the payment of cash benefits, and they may therefore be brought into contact with the doctor on questions of certification of incapacity; but not even on such matters have they any power directly to control the doctor's work. Indirectly, however, the societies, as representing insured persons, nominate three-fifths of the members of the insurance committee. The insurance committee is the body which deals with the practical administration of medical benefit. It is with this committee that the doctor enters into his agreement; and it is this body which will, in the first instance, investigate any complaints made by or against him. The committee also distributes the remuneration. Even this committee cannot, however, alter the doctor's terms of service without the express consent of the Minister of Health.

On all important matters the Minister of Health determines the conditions of insurance practice; and it is with him that the Insurance Acts Committee of the British Medical Association hold the consultations which, in practice, have always preceded any material alteration in the terms of service. The doctor has a right of appeal to the Minister from any disciplinary decision of the insurance committee; only the Minister can alter the rate of remuneration or inflict a pecuniary penalty. The Minister has appointed regional medical officers throughout the country. In addition to their specific duties as referees, these officers are in a position to offer general advice and guidance, and it is to the advantage of a doctor entering into insurance practice to become acquainted with the regional officer for his district.

Finally, there is in each area a panel committee which is a body directly representative of insurance doctors. All the members are doctors and three-fourths are panel doctors. It may be said, generally, that the panel committee must be consulted by the insurance committee on all matters (e.g., the alteration in the terms of service) which materially affect the insurance doctor. The panel committee is also a body which can be consulted by the individual doctor on any matter of doubt, more particularly when the opinion of the profession rather than the official view is desired.

ALLOWANCE FOR SUBSCRIPTIONS IN ASSESSMENT FOR INCOME-TAX.

THE question of allowance of subscriptions to medical societies and periodicals is one which often arises, and we have received the following letter on the subject from a correspondent:—

"SIR,—Can you refer me to a regulation or a definite ruling to the effect that medical men are entitled to deduct, when making returns of their income for assessment of income-tax, the expenses incurred by subscribing to medical societies and periodicals? I am employed whole time by the Ministry of Pensions for a definite salary; two or three years ago, after a long discussion, I succeeded in persuading the Inspector of Taxes for this district that I was entitled to allowances for such expenses on the ground that a medical man must keep his professional knowledge up-to-date, and the deductions were accordingly allowed for two or three years. The Inspector of Taxes has, however, now written to me as follows:—

"'With regard to your claim for allowance of the expense of subscribing to certain periodicals and professional associations, I have referred to previous returns and correspondence, but I do not find any evidence that the purchase of the periodicals in question, or membership of the associations, is an indispensable condition of the continuance of your office or employment under the Ministry of Pensions. If such is the case, and evidence is available, will you kindly let me have it? In its absence I consider that the allowances made in the past were not properly due, and I shall be quite unable to continue them.'

"The suggestion seems to be that as I am in Government employ it is not necessary for me to keep my knowledge up-to-date."

Where the question of allowance of subscriptions to medical societies and periodicals occurs in connexion with a practice there is no difficulty, for the assessment is then under Schedule D, one of the rules of which provides for a deduction of expenses "wholly or exclusively laid out for the purposes" of the profession. Where, however, the assessment is in respect of employment, and therefore under Schedule E, the Inspectors of Taxes usually object to allow such subscriptions on the ground that they are not provided

for in the rule requiring the expenditure of "money wholly, exclusively, and necessarily in the performance" of the duties. It has been urged in a similar case that a professional position requires professional qualifications, that such qualifications necessitate membership of professional societies, and that such membership involves the payment of annual fees for subscriptions and periodicals. The ruling, however, by the Board of Inland Revenue was that, in their opinion, the expenses in question did not fall within the provisions of Rule 9 (as to expenses), and that a deduction was, therefore, not admissible. It will be seen, then, that whilst the subscriptions are usually allowed to the man in actual practice, such a subscription is not allowed where a salaried position is being filled. In the latter case it is considered that unless the conditions of the agreement embody the requirement to belong to a society, the subscription thereto cannot be considered to be "wholly, exclusively, and necessarily" expended.

There is justification for the medical associations to urge that, where a professional qualification is required in the fulfilment of an appointment, the annual fee in connexion therewith should be allowed, and it would be well to take a test case to the Special Commissioners on the point.

Reports and Analytical Records.

"VULCAN" ELIXIR.

(MESSRS. MORSON AND SONS, 47, GRAY'S INN-ROAD, LONDON.)

THIS preparation—supplied in the form of a liquid—is intended as a tonic and as a general stimulant for the nervous, muscular, and digestive system. It is stated to contain lecithin, cerealin (wheat phosphates), papyotin (vegetable pepsin), nux vomica, milk-sugar, and the accompanying mineral constituents, potash, lime, iron, &c. The chemical examination shows total extractives (solid matter) 38 per cent., water 62 per cent., and the presence of milk-sugar, iron, lime, and phosphates, and, in general, substantiates the composition as set out by the manufacturers. The elixir contains no alcohol, it possesses an agreeable flavour, and constitutes a useful addition to this class of tonic. The presence of papyotin should serve to supplement the protein-dissolving enzymes in the gastric and pancreatic secretions in cases where diagnosis indicates a deficiency of these in the patient.

(1) CARDIBAINE; (2) DIGIBAINE.

(ANGLO-FRENCH DRUG COMPANY, LTD., 238A, GRAY'S INN-ROAD, LONDON, W.C. 1.)

We have received from this firm samples of these cardiac tonics of which the former is crystallised strophanthin, called Ouabaine in France, and the latter is a combination of the former with digitalin. Ouabaine is strophanthin prepared from *Strophanthus gratus* in a state which the pharmacologists have taken care should be one of perfect purity from the collection of the seeds, which is carefully supervised, to the last stage in preparation. Of the recognised use of strophanthus as a cardiac tonic and diuretic nothing need be said here. Cardibaine is administered orally and intravenously, but a warning is issued against intramuscular injection as dangerous and even impracticable. The intravenous method is used when rapid results are required as in acute dilatation of the heart. The drug is supplied in ampoules containing ¼ mg. for intravenous use, and in solution for use by the mouth, when the dose is from 15 to 30 drops twice or thrice daily according to a physician's prescription. Digibaine, the combination of Ouabaine with digitalis, which is indicated in cardiac conditions where digitalis is ordinarily employed, has been found of value by French physicians, who have tried it in prolonged tonic cardiac treatment, for valvular conditions with lack of compensation and cardiac insufficiency. This drug is also supplied for oral and intravenous use.

ALLONAL.

(HOFFMANN-LA ROCHE CHEMICAL WORKS, LTD., 7 AND 8, IDOL-LANE, LONDON, E.C. 3.)

The full name of this preparation showing its composition is allyl-isopropyl-barbituric acid with phenyl-dimethyl-amino-pyrazolon. It is put forward as a hypnotic and analgesic which can be employed as a substitute for morphine as it seems to have no habit-forming propensities. Numerous clinical reports have been published in the American medical press, but the drug is new to the English market. American experience goes to support the claims of the manufacturers that allonal is a remedy of real value for controlling insomnia and pain. As the preparation contains a derivative of barbituric acid it comes within the scope of the Poisons Schedule and is only supplied to registered practitioners and pharmacists.

MERCUROCHROME.

(W. HARRISON MARTINDALE, 10, NEW CAVENDISH-STREET, LONDON, W. 1.)

Mercurochrome "220" has a chemical composition—dibromo-oxy-mercury fluorescein, or its sodium salt. The compound contains over 20 per cent. of mercury, but, as a vesical antiseptic in a 1 per cent. aqueous solution, can be tolerated by the bladder for one to three hours without occasioning pain. It has been referred to in medical literature as being rapid in effect as an antiseptic in cystitis and pyelitis; it has also been used in gonorrhœa, chancroids, and as a dressing for buboes. We have here a preparation which acts as its chemical composition would lead us to anticipate. It is supplied in 10-g. bottles at the price of 13*s.*, but a 1 per cent. solution ready for use as an antiseptic bladder injection is sold in 4-oz. bottles, price 3*s.*

SANTOPERONIN—A NEW ANTHELMINTIC.

(ORBIS WORKS, LTD., BRUNSWICK; MATTHEWS AND WILSON, LTD., COLE-STREET, LONDON, S.E. 1.)

The very high price of santonin at the present time has stimulated the demand for an effective substitute as a therapeutic agent in the treatment of intestinal parasites such as thread-worms and round worms. A preparation that has recently been submitted to us for this purpose is santoperonin, which is claimed to be extremely effective against the foregoing parasites and also against tape-worms, which of course are very resistant to santonin. Santoperonin is a reddish-brown powder, insoluble in water, and containing copper in combination with an organic substance the constitution of which is somewhat indefinitely described as being a derivative of phenol and a lactone derived from naphthalene, and bearing in Germany the name of santoveronin. Santonin itself is a lactone derived from naphthalene, but also contains a ketonic group, and recently it has been shown that the active principle of male fern is a phenolic compound, and in santoperonin an attempt has been made to combine the therapeutic effect of these two substances and also the anthelmintic properties of copper. The sample submitted to us contained sulphate, but otherwise appeared to agree with the maker's description. Although insoluble in water, santoperonin is decomposed by dilute mineral acids with liberation of the corresponding copper salts, and therefore acids and acid foods should be avoided when it is used, and it is also advisable to administer it in conjunction with magnesia to prevent it from being attacked by the gastric acids. The use of calomel or of phenolphthalein with santoperonin is also contra-indicated.

The dose of santoperonin is 0·03 g. for adults, and 0·01 to 0·02 g. for children, two to three times daily. It is free from the horrible taste of male fern, and appears to be agreeable to take. Its use is stated to be free from danger, an accidental overdose merely producing vomiting with ejection of the drug. Eulogistic clinical reports are given by Wolfheim (*Der Landarzt*, Nov. 1st, 1923). In view of the small doses required and its lower cost, it should prove more economical than santonin in the treatment of round worms and thread-worms, and it may possibly prove superior to pelletierine tannate in the treatment of tape-worms.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 23, 1924.

THE CAMPAIGN AGAINST CANCER.

A WISE distribution of any moneys entrusted to the British Empire Cancer Campaign is now assured. The Scientific Committee appointed to advise on the administration of the funds collected by the British Red Cross Society for the campaign consists of the following distinguished members: Sir JOHN BLAND-SUTTON, Dr. H. H. DALE, F.R.S., Sir RICHARD GARTON, Prof. F. GOWLAND HOPKINS, F.R.S., Dr. ROBERT KNOX, Sir WILLIAM LEISHMAN, F.R.S., Prof. C. J. MARTIN, F.R.S., Prof. ROBERT MUIR, F.R.S., and Sir HUMPHRY ROLLESTON. It is stated—not very exactly—that half of this number have been selected jointly by the Medical Research Council and the Royal Society. The general aims of the campaign are set out in modest language in the manifesto, and are worthy of public support. No extravagant promises are made, but it is pointed out that more money means more research workers and better facilities for their work, that investigations can be pushed in fields as yet untouched, that variations in cancer incidence in different parts of our own country and abroad may be explained, and that dissemination of the knowledge thus acquired must help towards success against one of the most dreaded scourges that afflict mankind. In the nine months since the campaign was first started £70,000 have been collected, and though it is hoped ultimately to obtain a much greater sum, the Scientific Committee is to be called upon to apply the money already received without delay. Its specific functions will be to devise schemes of research and to advise and report upon questions relating thereto, including the allotment and application of funds. The Committee will also be closely concerned in maintaining communication between workers all over the world, in making their results and discoveries mutually available, and in keeping the public informed of the nature of the problems to be solved, and the progress made towards their solution.

In wishing good speed to a movement which is now proceeding under such happy auspices, we would add one more to the messages that have been sent to subscribers, actual and potential. We have already hinted that they must be prepared to pay the piper without calling the tune. This will be the less irksome, since the untrained sympathiser is for the most part not able to distinguish between the tunes. And workers in laboratories dedicated to research on cancer or any allied problem cannot be marshalled and organised like an army; they serve not one but many kings, and are as careless of the etiquette of the battle as are members of foreign legions. But one thing must not be forgotten: they are not merely mercenaries. They will coöperate gladly as individuals, but at a hint of autocratic control they disappear from the field, to fight the problems of another disease in their own way, with their own weapons. Thus coöperation cannot be enforced; neither can overlapping be prevented until we have an official audit of the results of research—a prospect far enough off at present. The only guarantee that any new weapon has been well planned and forged is that others can use it with as good effect as its inventor. The contrast between the immense literature on insulin which has arisen since 1921 and the comparative silence that has followed other apparently important discoveries announced within recent years is significant. The speed with which a crowd of workers appears at the centre of a new and hopeful discovery is like the rush to a reputed gold mine. Claims are staked out, lines of communication are established; if there is no gold after all, the crowd soon fades away. But when the existence of a mine is proven, one man cannot work it alone. The success of Japanese workers in producing cancer in mice by painting with tar stimulated investigators in many different laboratories throughout the world to try this method, and the result of this overlapping has been to create a new era of research in which the Japanese technique is the beginning, not the end, of experimentation.

One point remains to emphasise in fairness to those who have already devoted their lives to cancer research. The absence of knowledge as to the cause or the cure of cancer has misled many into thinking that little is known of this disease. And yet, just because there is no parasite to distract the attention of workers from the bodily lesions, or because experimental production of these lesions has till recently been impossible, it is actually the case that the descriptive pathology of cancer is more developed and better known than that of almost any other disease. Classifications in terms of malignancy, of embryonic tissue of origin, of distribution, of histological appearances, are numerous and are all justified; early symptoms and signs are defined; and treatment, both operative and palliative, has been worked out in detail. All this information has been laboriously collected and recorded for a long term of years. Even now more is known about the pathology of cancer than about the pathology of diabetes mellitus. It may need but the touch of some magic wand to transform this enormous pumpkin into a coach which will drive us to complete enlightenment. Let us hope that the British Empire Cancer Campaign will prove the fairy godmother.

CHILDREN AND YOUNG PERSONS.

WE noticed last week certain prominent aspects of the Children, Young Persons, &c., Bill, which has just been published as a document of 150 pages containing 200 clauses, many of whose provisions, as we said, will command the universal approval without which the Bill cannot become law. The document should be read by medical men, who will see in the bold proposals evidence of a new spirit of social and domestic reform, quickened undoubtedly by the growing influence of the women's vote.

If the Bill is examined in order to compare its wording with the law as it stands to-day, we find that, quite apart from the sweeping changes of principle, the minor details manifest a progressive amplification. Gaps are closed; the old scales of penalties are made steeper, and the old precautions and protections are strengthened. Examples of this process are furnished by the clauses dealing with prevention of cruelty. The present offence of failing to provide "adequate food, clothing, medical aid, or lodging" (under Section 12 of the 1908 Act) reappears in the Bill as failure to provide "sufficient and proper food and clothing, or sufficient lodging, or any requisite medical or surgical treatment." Neglect causing injury to health already covers mental derangement; the Bill adds also "any loss or diminution of mental power." Another familiar section of the Children Act of 1908 penalises a person who, going to bed under the

influence of drink, suffocates an infant under 3 years of age lying in the same bed. The new Bill enlarges "bed" to include couch, sofa, or chair, and "drink" to include drugs; it raises the age limit from 3 to 7, and extends the offence to persons who take drink after going to bed. Little points like these show that the draftsman has been directed to leave no loopholes, and medical evidence of many deplorable inquests has furnished the arguments on which the stiffening procedures have been based. Naturally the elaboration manifests itself in varying degrees of importance. The Act of 1908 forbids juvenile smoking, and allows a constable or park-keeper to confiscate the cigarettes of a person apparently under the age of 16, and to "search any boy so found smoking, but not a girl." Here was a gap to be stopped, and so the new Bill adds a proviso that girls too may be searched by women constables and women park-keepers, though we wonder if girls of 14 and 15 smoke in the parks to this significant extent. A more valuable innovation occurs over the removal of children from the custody of a convicted parent or from an otherwise undesirable home and their commitment to the care of some "fit person." These last two words are to cover any society or body corporate, existing or future, established for the reception and protection of poor children or for the prevention of cruelty to children. If such "fit person" can satisfy the magistrates that the child is a lunatic or defective, or a confirmed epileptic, or a sufferer from cancer or tuberculosis, or that its earning capacity is affected by impaired powers of sight, hearing, or speech, the commitment order can be extended in duration till the child comes of age.

Legislation along these detailed lines will hardly arouse controversy, except upon the lines ever open to the disputant that penalties are being suggested in directions where convictions will be difficult. Nor will the revision of the enactments about industrial and reformatory schools—a topic excluded from the scope of the consolidating Education Act of 1921—endanger the prospects of the Bill, nor the clause which seeks to prohibit the printing or publishing of the name or address of any child or young person charged with any offence short of murder or serious assault. There is, however, no disguising the fact that the Bill contains controversial elements. Anyone who recalls the delays and modifications imposed upon the Bishop of London's 1914 Bill before it emerged as the Criminal Law Amendment Act of 1922 will remember the sharp conflict over proposals to raise the age of consent. Similar hostility probably awaits the present proposal to abolish the defence, in certain cases of criminal assault, that the accused reasonably believed the girl to be 16, while it may be remarked that this defence will, it seems, still be open to a priest who is liable to two years' hard labour if he celebrates the marriage of a girl under 16. The new proposals for compulsorily clearing the court in certain cases will invite the comment that only two years ago it was found desirable to cancel the 1908 provisions for trying incest cases in camera. Criticism may also fasten upon the fact that in a Bill which in general purports to limit the criminal liability of children and young persons there appear to be some marked extensions of that liability. The 1908 sections which penalise the suffocation of infants in bed and the exposure of children under 7 to the danger of being burnt or scalded at an unprotected fire-grate apply only to offenders who are 16 years of age; the new Bill omits this age limit. Finally, some critics may think it unnecessary to provide that a boy of 14 or 15 must not be sentenced to be whipped, while a boy of 12 or 13 may still be whipped upon summary conviction. These points, however, if they be matters for disapproval, affect legal and judicial rather than medical opinion.

Bills which merely consolidate existing law are often blessed with a smooth and rapid passage through Parliament. The new Children Bill both consolidates and amends, and the amendments are frequent and substantial. If it should not at once attain the success for which its advocates are hoping, it will nevertheless be of value as a comprehensive statement of social policy upon which civic attention can usefully be focused.

RADIUM THERAPY.

WE have learned to look to the annual reports issued from the Radium Institute not only for a clear account of the year's work but also for an instalment of the serial story of radium therapy. The report for 1923, just issued, brings no disappointment, for 15 of its 30 pages are devoted to remarks on radium therapy in diseases of the thyroid, thymus, spleen, and lymphatic system, corresponding to the discussion last year of the uses of radium in diseases of the alimentary canal, and the description of its application to gynæcological conditions in 1921. The general account of the year's work, with a table of cases seen for the first time in 1923, is compressed into seven pages, while a summary by Dr. J. C. MOTTRAM of the five papers published from the research department during the year, and a technical report of the work under the charge of Mr. W. S. S. ALTON in the chemical and physiological laboratories, complete the report.

Mr. A. E. HAYWARD PINCH, the director of the Institute, notes that the provision of a limited number of bedrooms for the reception of in-patients has proved of great value. The available accommodation is always in demand and its early extension is announced. The programme outlined for occupying the patient between the four periods of exposure into which prolonged gamma radiation is divided shows a consideration for his comfort rare in institutions; the hours of treatment and rest are so disposed that the patient's normal habits of life are but little disturbed. The policy of declining to treat operable cases of malignant disease, other than rodent ulcer, has been rigidly adhered to, except when the patient has definitely objected to operation. This steadfast refusal to substitute for an established method, with definite and permanent cures to its credit, one which is still on trial must confirm the respect in which the Institute is held by the profession in general, and especially by surgeons. Indeed, the coöperation of surgeons has recently been sought with greater frequency, in order to provide the most convenient and effective access of the radium tube to the growth. The treatment of laryngeal tumours by subhyoid pharyngotomy, and of carcinoma of the cardiac end of the œsophagus by radium through a gastrotomy opening offer examples of a combined technique which is likely to develop still further in the future. The value of the combination of diathermy with radium is also insisted on, especially in the relief of carcinoma of the tongue and mouth. The general trend of radium therapy, other than that of abdominal viscera, is in the direction of increase of dose, the systemic disturbance caused by a large dose being transient. Radiation of the abdominal cavity, however, must be less concentrated, since the goblet cells of the intestine are peculiarly susceptible to gamma rays and when damaged are liable to infection

from the canal. Mr. HAYWARD PINCH seeks again to dispel the prejudice against radon—the name recommended by an international committee to replace the clumsy "radium emanation"—among practitioners. The therapeutic effect of radon and radium salt is stated to be identical; that the former gradually loses its potency, whereas the latter retains it almost indefinitely, is no real disadvantage, since the rate of decay does not vary and can be calculated in advance. The advantage of borrowing a highly compressible gas of no intrinsic value in a small tube rather than of an applicator containing some hundreds of milligrammes of a most expensive salt, with all the attendant risks, should be obvious. Advice is freely given to practitioners on treatment with radon apparatus, and where precise information of the nature and extent of the disease or growth is furnished full instructions as to technique and exposure will accompany the apparatus lent.

It will be seen that much useful information is given in small space. The least enlightening sections of the report are the tables; these comprise only a classification of patients who were seen for the first time between Jan. 1st, 1923, and Dec. 31st, 1923. The statistics as regards malignant disease of an institution where none but inoperable cases are treated could certainly not make encouraging reading if supplied over a term of years, and even those of certain medical diseases would probably be depressing. Great interest, however, would attach to the present condition of patients first examined before January, 1923, of whom we are told nothing, except that many of them were still under treatment during the past year. The difficulties of following up cases are admitted, and we do not suggest that special efforts should be made to keep in touch with old patients where this would entail trouble and expense that could not fairly be incurred. But since it is claimed that radium increases the duration as well as the comfort of life for certain incurable patients, an additional table chronicling the present condition at least of all who are still in attendance would be welcome. The only other criticism to be made refers to the headings under which cases are classified. The column headings common to both tables are as follows:—Table I. having an additional column differentiating the diseases treated: examined but not treated (31), recent report not received (127), received prophylactic radiation only (25), apparently cured (137), cured (93), improved (328), not improved (94), abandoned treatment (10), died (23). The absence of information as to the period regarded as recent—the whole period under consideration is only one year—prevents full estimation of the value of the other details supplied. In pleading for a revision next year of the way in which the tables are compiled, the hope is shewn that the undoubted value of radium therapy may receive more general recognition and that especially in certain otherwise intractable medical diseases it may be given a trial. There is set out on p. 409 an account taken from the report of the beneficial effect of radium in diseases of certain glands and of the lymphatic system. Of the five cases of lymphadenoma first seen during 1923, three showed improvement after treatment and one was apparently cured, whereas of each form of leucocythæmia four cases were treated and two showed improvement. A closer coöperation between surgeons and those undertaking radium therapy has now been secured; it remains for physicians to take fuller advantage of such hopeful signs as are available that this agent has at least the power of postponing death in certain dangerous diseases of the blood.

AFTER-CARE FOR THE TUBERCULOUS.

> "Teaching Chinese to a Negro, infusing a Latin-American with a Puritanical outlook on life, or inducing statesmanship in a politician, are problems equal in toughness to finding a suitable job for a tuberculous person, and keeping that person in that job."

So difficult is the problem of after-care in tuberculosis, in the words of Mr. J. BYRON DEACON, director of the New York Tuberculosis Association. In this country the solution of the problem looks more hopeful in the light of two public announcements. The Minister of Health decided that the time had come for removing the present restrictions on grants for the development of the tuberculosis service, and at the same time the Minister of Pensions issued instructions designed to secure the coöperation of all local agencies in the after-care of ex-Service men suffering from tuberculosis. Everything possible is to be done to assist these men to obtain employment in a suitable occupation, but it is desirable to be frank about the difficulties. Pensioners now receiving sanatorium treatment are for the most part either cases of chronic advanced tuberculosis or of chronic bronchitis with quiescent (or only suspected) tuberculosis. The former are unfit for work; the latter, being very dependent on climatic conditions, are not satisfactory from the employers' point of view. Many pensioners have been idle for so long that recommencement of work is difficult, mentally and physically; if they do not give satisfaction in the first few days they are liable to be discharged. The objection of employers to a tuberculous employee has fourfold origin: (1) His efficiency is, almost invariably, considerably less than that of the average worker; (2) customers and fellow-workers object to one who coughs, or has scars or deformity resulting from a surgical operation; (3) any case of tuberculosis occurring among fellow-workers will be ascribed to the patient, even should he be actually non-infectious; (4) some moral obligation is felt to help an employee who has a temporary or permanent relapse. Special facilities for pensioners at the employment exchanges must, therefore, be supplemented by arrangements and personal interviews with employers, and by general education of the public. It is difficult for the tuberculosis officer, overwhelmed as he is with clerical and other non-clinical work, to find time for this, but every such officer who is worth his salt has already worked on the lines suggested by the Minister of Pensions. Industrial workshops on the model of Dr. C. F. PEDLEY'S "graded factory" (THE LANCET, Feb. 16th, p. 369) are well worth a trial, although here again there are serious hindrances, the chief of which are: (1) To conduct such a business without serious financial loss, (2) to avoid conflict with trade-unions over questions of wages, (3) to find a market for goods, which may require preliminary disinfection.

In a recently published book,[1] with the title, "How Shall I be Saved from Consumption?" Dr. HENRY A. ELLIS gives much useful advice to the potential consumptive. He calculates that £1 spent judiciously on after-care is worth £3 spent on the dispensary, and £1 spent on the dispensary is as fruitful in good results as £6 spent on a sanatorium. This is also the chief lesson now being taught by the New York Tuberculosis Association. In its *Bulletin* for November and December, 1923, Mr. DEACON puts the matter graphically in the following words:—

> "Picture a fine foot-bridge built across a swamp, but left uncompleted just a few spans short of solid ground, thus obliging those who use it to step off and wade through the bog to cover the last lap to firm earth . . . just short of landing the consumptive on the solid ground of social and industrial readjustment. Six millions of dollars are expended each year for the maintenance and treatment of the tuberculous of New York City, in hospitals and

[1] How Shall I be Saved from Consumption? By Henry A. Ellis, B.A., M.B., Ch.B., assistant physician to the Margaret Street Hospital for Consumption, London. London: George Allen and Unwin, Ltd. 1923. Pp. 190. 6s.

sanatoria. An additional 5 per cent. expended on after-care would complete the bridge."

The same author calculates that about one-half of all the tuberculous in New York may be classed as permanently disabled, unfit to work full time all the time. He assumes that New York City has 20,280 tuberculous wage-earners or housekeepers, half of whom require help, supervision, and after-care. Realising their needs, the New York Tuberculosis Association has decided to organise a "vocational and placement service," the duties of which are to discover suitable occupations for persons with quiescent or arrested tuberculosis. Since research is an important part of this service, accurate and detailed records are kept by the staff, which consists of an executive, a medical consultant, two "placement" secretaries, a medical social worker, and a clerk-stenographer. A grant of money from the Laura Spelman Rockefeller Memorial has assured the continuance of this interesting experiment for three years, in the course of which it is hoped that a significant demonstration will be made. Meanwhile it is instructive to study the balance-sheet of the New York Tuberculosis Association published in the same number of its *Bulletin*. Of the $187,754.42 spent for the year ending Oct. 31st, 1923, nearly 20 per cent. was spent on training in health workshops men who were recovering from tuberculosis. Another 4 per cent. was spent on finding suitable employment for men and women on the road to recovery from tuberculosis. Health education (lectures, posters, newspapers, &c.) absorbed 28 per cent., and other health information work 9 per cent. Health work among children (holidays in the country, dental hygiene, &c.) absorbed 12 per cent. Research work has required 8 per cent. and general administration 9 per cent. The most striking feature of this balance-sheet is its disclosure of the fact that the New York Tuberculosis Association is attacking the problem at its two ends, and is hardly even nibbling at what is commonly regarded as the centre of the problem. More than 50 per cent. of the Association's funds are spent in research, education, and prevention, and almost a quarter is spent on after-care. There can be little doubt that the three-year experiment on after-care, to which we have just referred, will show that the New York Tuberculosis Association has been well advised in devoting so much of its finances to this hitherto much neglected section of the anti-tuberculosis campaign.

IN HONOUR OF DR. BRACKENBURY.

THE desire to recognise the eminent services to his profession of Dr. H. P. Brackenbury will find, we are sure, very general expression in all medical circles. An influentially signed letter in our correspondence columns calls attention to his brilliant work in presenting the case of the insurance practitioner before the recent Court of Inquiry. At one point in this inquiry the chairman of the Court so far lost official self-control as to say how fortunate the medical profession should count itself in having such an able and persuasive advocate as Dr. Brackenbury. He added, amidst laughter, "We shall have to steel our hearts against being unduly influenced by his pleadings." He did not add that although in the past Dr. Brackenbury may on occasion have been nettled by his friends, he has never been known to lose his urbanity in the presence of opponents. The first dinner in his honour was given by the London Panel Committee during a period of sharp internal criticism of the Insurance Acts Committee, and the warmth of feeling then shown proved not only very welcome to him, as the chairman of that committee, but was evidence of the confidence in his knowledge and advocacy felt by his professional colleagues. On a subsequent occasion Dr. Brackenbury himself stated that he wanted no better reward than the loyalty and sympathy of his colleagues. That reward he may rest assured of possessing.

Annotations.

"Ne quid nimis."

INFECTION BY PUBLIC TELEPHONE.

THE possibility of transmitting infectious disease through the use of public telephones is one that naturally concerns health officers, and the Postmaster-General has recently issued a press notice asserting that there is no real risk in the use of telephones in public call offices, and that the alarm raised from time to time has no foundation in fact. It may be useful to set out briefly the medical opinions on which this assertion is based. In 1905 Dr. William Collingridge, then medical officer of health for the City of London, caused some bacteriological experiments to be carried out in conjunction with the National Telephone Company for the purpose of ascertaining whether call office telephones, if used by persons suffering from contagious or infectious diseases, were likely to be a source of danger to the public. Prof. E. E. Klein, who carried out the investigation at St. Bartholomew's Hospital, reported that the results confirmed a previous inquiry by the City medical officer of health, and proved that there was no risk of infection. As a result of growing public interest Mr. Herbert Samuel in 1910 gave instructions that a number of telephones fitted in call offices in London, which had been in use for various periods of time and had received no special cleansing treatment other than that normally given to telephones of the kind, should be examined by an expert bacteriologist. The mouth-pieces were chosen from call offices at railway termini, post offices, meat markets, and other places of general resort, and were forwarded to Dr. H. R. D. Spitta at St. George's Hospital. In addition, Dr. Spitta was also furnished with a mouth-piece which had been used by a tuberculous patient, and with others from the Tidworth Sub-Post Office which had been used by consumptives from the South Brent Sanatorium. Dr. Spitta reported that his experiments had confirmed in every respect the results obtained by Prof. Klein six years before. The mouth-pieces examined were free from tubercle and diphtheria bacilli, and no other organisms pathogenic to guinea-pigs were present. It was thought desirable, however, to conduct a further series of experiments with telephones which had been used solely by tuberculous patients, and arrangements were accordingly made to fit telephones in the Frimley Sanatorium for the use of the consumptives there. These telephones were kept in use for periods ranging from seven days to four weeks and were then forwarded for examination. In February, 1912, Dr. Spitta submitted a second report to the effect that this further series of experiments was entirely negative in its results, and that with the data thus afforded, and in view of the results of his former experiments, he was of opinion that the transmission of tuberculosis through the medium of the telephone mouth-piece was practically impossible. These results were borne out by an independent inquiry initiated by the American Government. The Postmaster-General alluded in his press notice to the routine precautions that are taken to ensure this measure of safety. The call offices are cleaned and the transmitter mouth-pieces and receiver caps disinfected at intervals of about three days. The cleaning of public call offices situated in residential flats, shops, and other private premises is undertaken by the tenants of the premises, while the cleaning of call stations in post offices is carried out under the supervision of the postmaster.

TETRAGENUS SEPTICÆMIA.

ACCORDING to Mlle. Raissa Falk-Trotsky,[1] of Petrograd, who records three cases in her Paris thesis, two of which are original, *M. tetragenus*, which is a saprophyte of the skin and nasopharynx, is

[1] Thèse de Paris, 1923, No. 285.

capable of becoming virulent and giving rise to septicæmia. This form of septicæmia usually develops in association with other micro-organisms, especially the tubercle bacillus. Two forms of tetragenus septicæmia have been described—viz., a mild form characterised by fever, gastro-intestinal disturbance, and transient pleuro-pulmonary symptoms lasting from three or four days to about a week, and a malignant form, characterised by multiple lesions, deep-seated and subcutaneous suppuration, intense toxæmia, prolonged duration, and frequent relapses. The diagnosis of tetragenus septicæmia is impossible apart from an epidemic, but considerable diagnostic importance is to be attached to the hectic character of the fever, the multiplicity of the lesions, the absence of any important symptoms such as enlargement of the spleen, when the condition simulates typhoid fever, or of laryngo-bronchial catarrh in cases resembling influenza, and the frequency of remissions and relapses. An exact diagnosis, however, can only be established by direct examination of the pus, blood cultures, and serum agglutination. The immediate prognosis is relatively good, even in the severest forms, but the remote prognosis should be guarded owing to the frequency with which tuberculosis develops. The use of auto-vaccines is the best method of treatment. A bibliography of recent literature is appended to the thesis.

PRIMITIVE PATIENTS.

"WHAT a mean fellow you are!" said a Congo chief to the Rev. W. H. Bentley, who had cured the native of an illness and had come to inquire after his health. "What a fuss you made! I had to eat a fowl and feed well; what strange things you white men are! Why did not you give me a present when you left? What a mean fellow you are!" This passage is cited from Prof Lévy-Bruhl's "Primitive Mentality," a work of which one of the most interesting chapters is headed The Primitive's Attitude to European Remedies. Here are set down numerous instances of the curious demeanour of Central Africans, natives of New Guinea, Battaks, Basutos, Melanesians, and South American Indians towards the medical men, lay and missionary, who have helped them. When cured of a large and loathsome ulcer, for instance, they expect a solatium from their benefactors. Nor can they understand why the demand of a present appears illogical to the white doctors. Prof. Lévy-Bruhl explains the attitude of the native in a manner at once surprising and convincing. The native, in the first place, is not aware that the medical man has taken any real trouble in his case. His attendances, often laboriously undertaken, his prescriptions, soup, rest, bandages, and so forth are to the native so much hocus-pocus, the kind of thing a medicine-man must "keep up" in order to maintain his mysterious prestige. Any good medicine-man, as every primitive knows, has such virtue within him that he could cure a man right away by his mere touch. If, therefore, the native submits to a long and tiresome treatment he does so with his eyes open and as one playing into the hands of a conjurer. He humours the white healer just as he would humour a native wizard. But he expects to be paid in kind for his complaisance. "I have played into your hands, my good sir," he says in effect, "and I deserve a reward—a yard or two of cloth, or a pocket-knife. Better still, I deserve to be kept by you in future, fed, clothed, and all." The Rev. J. Mackenzie had cared for and cured a native whose face had been terribly lacerated by a tiger. "My mouth is not exactly where it used to be," said the native condescendingly, ". . . but the wound is quite whole. Everybody said I should die, but your herbs cured me. You are now my white man; please to give me a knife." After some further pour-parlers the medical missionary "gave the man up as a very wonderful specimen of jumbled ideas." But the man was less oblique than his mouth. He was following, as Prof. Lévy-Bruhl clearly shows, a definite line of primitive thought. In allowing himself to be treated by a foreigner, a man with other and distant gods, other "medicine," other habitat, totem, and tribal connexions, he as a good native of the districts north of the Orange River, with his own gods (ancestors), medicine, habitat, totem, and tribalism, had taken immense risks, and, though cured, now found himself a kind of lost soul in limbo, a man cut off from his own ancestral and tribal environment. He now clung to his benefactor, who had become his "white man." And the least that the new white man, now responsible for him in this world and the next, could do was to give him a trifling present, the first of many to come. Sometimes the primitive dodges these vast risks. He lends himself for a specified period to the dangerous alien influences. Thus a powerful South Sea Island potentate allowed his young wife to become a Christian while undergoing a cure, but with the proviso that she was to return to her native gods after the treatment, as she would have to be strangled on the day of his death. She was at least to die in spiritual safety.

We read between the lines in the pages of Prof. Lévy-Bruhl, and are constantly reminded of parallels between the mental attitude of natives and the primitives to be found in many out-patient rooms and poor practices. It is common for hospital patients to believe that by allowing themselves to be treated they confer a favour upon the physician or surgeon. In its crudest form the belief involves the assumption that the doctors should be glad of an opportunity to practise, but the attitude of a "show patient" often indicates a sense of mutual obligation which, if we search our hearts, is not without foundation. Pride in a good job well done, apart from a welcome enhancement of reputation, may stimulate a feeling of gratitude towards the patient who has provided the occasion. That the situation may be recognised by the patient was shown by a wounded soldier who, told that the attempt to save his leg had failed, replied to the surgeon, "Well, sir, I've wanted it off for a long time, but you seemed so interested that I didn't like to say so." In this sentiment, put forward respectfully and with good intent, is expressed the idea of a favour conferred. The medical missionary, like the surgeon in this case, is keen to exercise his art, and the intuitive savage may be trusted to recognise this keenness. From this is a short step to the belief that any obligation is on the side of the healer and this process may account for some of the examples that would not be covered by Prof. Lévy-Bruhl's ingenious generalisation. The fear of the "doctor," the contempt of him, followed by ingratitude or a demand for money, are not unknown to many a surgical dresser in the east ends of large towns. Motives of policy have doubtless restrained our author from emphasising parallels, a large treatise upon which might yet be written.

THE INFLUENCE OF ATMOSPHERIC PRESSURE ON AN ARTIFICIAL PNEUMOTHORAX.

IT has been known for many years that patients undergoing treatment by artificial pneumothorax may experience some discomfort on going from a low to a high altitude, but few exact observations have been made, such as those recorded by Dr. C. Mantoux in *Revue de la Tuberculose* (1923, vol. iv., No. 6). The patient on whom the observations were made was given a refill of 310 c.cm. of nitrogen in the right pleural cavity on Sept. 19th at 1.50 P.M., when the barometer at Chamonix registered 712 mm. of mercury. The initial pressure of −6 was raised to +9 by the injection, the pneumothorax being complete. At 2.25 he left Chamonix, which is 1050 metres above the sea, and he arrived at Montenvers, which is 1914 metres above the sea, at 3.15, experiencing a sensation of fullness in the chest on the way, and slight pain over the base of the left lung on his arrival at Montenvers. A pleural rub, which had not been heard earlier in the day, was now demonstrable over

the base of the left lung. At 3.35 exploratory puncture showed the intrapleural pressure to be +17. The barometer measured 656, or 56 less than the barometer in Chamonix. During the patient's short sojourn at Montenvers, the respiratory discomfort and cough rapidly diminished, and had completely disappeared by 4.10. He left Montenvers at 4.40, reaching Chamonix at 5.25, when the barometric pressure was 709. At 5.55 the pleural rub was found to have disappeared, and the intrapleural pressure to have fallen to nil; on the injection of 100 c.cm. of nitrogen the pressure was again brought up to +9, without causing respiratory distress or the recurrence of a pleural rub and pain. Although it is evident from these observations that the rise in the intrapleural pressure caused by an ascent to a high altitude is rapidly neutralised by the absorption of the gas, some distress may be experienced in the interval by patients with a total pneumothorax which has recently been refilled. A comparison of the barometric with the intrapleural pressures showed that the actual rise of the intrapleural pressure was much less than that which would have occurred had not the gas been rapidly absorbed, and, perhaps, the relation of the bag of gas to the other contents of the thorax changed somewhat. The usual rate of absorption of nitrogen by this patient was 0·25 c.cm. per hour. On the present occasion, however, he had absorbed 100 c.cm. in about four hours. In other words, the rate of absorption had been increased a hundred-fold. The pleural rub heard over the left base had been heard on an earlier occasion when the intrapleural pressure on the right side had been raised to +17, and it was thus evident that this basal pleurisy was a response to an intrapleural pressure on the opposite side exceeding the optimum—an observation which may prove a useful guide when the optimum intrapleural pressure in a given case is being sought.

THE LISTER WARD AT GLASGOW.

ALL hope of the retention of his ward in the Royal Infirmary, Glasgow, as a permanent memorial to Lord Lister would seem to have disappeared with the beginning of its demolition. For more than a week, we are informed, the work of destruction has been in progress, and there does not appear to be any likelihood of its suspension; for the decision of the managers passed unquestioned at the annual meeting of the subscribers on Feb. 11th. If the whole matter be examined impartially, two facts of importance emerge. In the first place, the final decision of the managers to demolish the ward was made in spite of world-wide protest from a large number of medical and scientific societies. The signatures to these formal protests include those of surgeons of international repute, and of high academic dignitaries in many countries. It is evidently their considered opinion that no more suitable monument to Lord Lister and his work could be found than the ward in which his fundamental clinical data were obtained. It must be admitted that the majority of the signatories could not but be in ignorance of the local circumstances which forced the managers to their decision; their protests are therefore based upon sentimental grounds. On the other hand, there has perhaps been a tendency to see in the policy of the managers a continuance of the undoubtedly inconsiderate treatment which Lord Lister experienced at the hands of the controlling body of his time. We feel that the managers must be acquitted of any such charges. The Faculty of Medicine is well represented on the Board, and there can be no doubt that the final decision has been reached from no other motive than an earnest desire to further the economic and scientific weal of the infirmary. Moreover, thorough consideration must have been given to what may be termed "middle course" solutions of the problem, outlines of which have appeared in our columns and in the lay press of the city, and although Mr. James A. Morris (whose first appeal for the preservation of the ward we discussed in October) has issued a further plea, mainly on historical grounds, in which he states that the offer of £2000 for the cost of reconstruction still holds good, no action has as yet been taken on these lines. While the passing of Lister's workshop can only be regarded as the disappearance of a structure which symbolised the most important contribution to surgical science that has ever been made, the decision to demolish the ward has been reached after much consideration by a thoughtful and unbiased body of men. In these circumstances surgical science, and indeed humanity, must accept as his monument, now and in the future, the world-wide continuous application of his principles. From no lips more fittingly than Lord Lister's might there have come the proud declaration:

> "Exegi monumentum aere perennius
> Regalique situ pyramidum altius."

THE PHYSIOLOGY OF THE STOMACH AND DUODENUM.

IN England and the United States the advent of the duodenal tube has been the occasion for a revival of interest in the physiology of the stomach and upper alimentary canal more important than any which has occurred since the publication of the original observations of Pavlov. While the limitations of intubation of the human subject are definite, and the greatest ingenuity can never secure experimental conditions as exact as those given by a healthy animal with an accessory stomach-pouch, the value of experiments done actually upon human beings compensates for this to a considerable degree. The most important contribution to this subject published during the present year is that of M. McC. Baird, J. M. H. Campbell, and J. R. B. Hern, which appears in the current issue of the Guy's Hospital Reports.[1] Not only does this article contain very valuable original observations, but the writers have carried out most painstaking investigations on lines suggested by the work of other researchers. Of these the more important are the experiments in which the total chlorides of samples of gastric contents were estimated at varying periods after meals, confirming the work of C. Bolton and G. W. Goodhart, who proved[2] the importance of regurgitation of duodenal contents into the stomach as the main factor in diminishing gastric acidity in the later stages of gastric digestion. This mechanism was first described by Boldyreff[3] following observations upon animals; its importance was emphasised by T. Izod Bennett and J. A. Ryle[4] in their observations on normal human digestion; and the work of Bolton and Goodhart, confirmed by the present observations, establishes it as a normal part of the gastric digestive function. At the same time Baird, Campbell, and Hern produce new evidence of the action of the pyloric portion of the stomach itself acting as an alkali-secreting medium; here they make use of an ingenious method by which two tubes are employed simultaneously. One, lying in the stomach, enabled them to withdraw fractions of the stomach contents; the other, in the duodenum, was subjected to continuous syphonage, so that the duodenal contents were aspirated and regurgitation into the stomach prevented. This method, which has been employed for somewhat similar purposes by R. K. S. Lim, A. R. Matheson, and W. Schlapp,[5] has the advantage of giving much less complex information, but requires great patience on the part of the subjects experimented on.

In the course of the series of experiments under discussion the observers were again confronted by the paucity of our present knowledge concerning the mechanism of control of the pyloric sphincter.

[1] Guy's Hospital Reports, vol. lxxiv., No. 1, January, 1924. London: Wakley and Son. 12s. 6d. net.
[2] THE LANCET, 1922, i., 420.
[3] Boldyreff: Quarterly Journal of Experimental Physiology, 1914, viii., 1.
[4] Guy's Hospital Reports, 1921, lxxi., 286.
[5] Edin. Med. Jour., 1923, xxx., 265.

The acid-control of the pylorus described by Cannon has been criticised by many workers. Baird, Campbell, and Hern, in their experiments, found that the emptying of the stomach occurred at rates by no means dependent upon the acidity of the contents of the pyloric antrum, and often in the presence of duodenal contents of a reaction definitely acid. The last part of their work deals with the problems of achlorhydria. They found that of 60 normal students examined only one showed this phenomenon when subjected to repeated observations, and close examination of this subject threw doubt on the question of his normality. It is admitted that for any adult the definition of health is almost impossible, and one may question whether the other 59 subjects examined would all have stood the test of searching clinical inquiry in this respect. Large numbers of subjects must still be examined before a final answer to this problem can be given; it remains certain that there are a considerable number of persons with achlorhydria living apparently normal lives. It is in connexion with the ætiology of pernicious anæmia that this subject finds its most immediate interest.

OCCUPATIONAL MORTALITY AND INDUSTRIAL UNREST.

THE student of medical sociology who turns to mortality records for some light upon the recent unrest among locomotive engine-drivers finds himself at a loss. The most recent figures published (samples from which are here given) refer, it is true, to 1910–12, but the comparative figure of the Registrar-General's

Comparative Mortality (England and Wales) in Certain Occupations. (Ages 25–64.)

Occupation.	1890–92.	1900–02.	1910–12.
Agricultural labourer ..	731	621	470
Shipbuilding	836	817	633
Railway engine-drivers and stokers	934	610	536
All males	1155	1000	790
Messengers, porters (not railway and Government) ..	1415	1449	1137
Seamen	1564	1646	1485
Costermongers	1911	2007	1507
Dock labourers	2114	1481	1127

occupational group, "engine-driver, stoker, cleaner" was equally satisfactory in 1900–02 and in 1890–92. At no period of life was the mortality experienced excessive, nor was any constituent cause of death in excess. In the *Statistical Bulletin* of the Metropolitan Life Insurance Company of New York for December, 1923, some statistics of the longevity of "locomotive engineers" are quoted, from which the authors infer that engine-drivers have an expectation of life "about as good as that for the average American male of corresponding age," and remark that the special hazards of the occupation "seem not to reduce his longevity prospect below that of males in the general population." We are rather surprised that the American experience is not more favourable. The group, as we have seen, enjoys in this country one of the lowest rates of mortality of any group, a much lower rate than all occupied and retired males, and an appreciably lower rate than members of the civil service. Calling the rate for all males 100, that for engine-drivers was 68, and for the civil service (clerks and officers) 77. This is hardly surprising, since the duties of the occupation can only be performed by physically select men, so that the rate of mortality is hardly a simple criterion of the salubrity of the occupation itself.

On the other hand, mortality data present real excuse for unrest among dock labourers. This occupational group has always stood high for death-rate; in 1910–12 (the last published records) their mortality was only exceeded (omitting occupational groups with special risks, such as silicosis among tin-miners and metal-grinders, and alcoholism among inn-servants and brewers) by costermongers, seamen, and messengers. Dock labour is not a skilled industry, and the unsuccessful of other trades tend to drift to it, as well as to messengering and costermongering. Here lies a reason for much of the high mortality; but low wages, uncertainty of employment, and conditions of work undoubtedly also contribute their share, for these persons need a better rather than a worse environment than obtains under other occupations. The dock labourer suffers in excess from alcoholic diseases and has a reputation for industrial drinking. The contrast between dock labour, shipbuilding, and agriculture is great, although the weather exposure in each is similar. Reference to the great causes of death which contribute to the total mortality discloses that, although all are high, the death-rates of dock labourers from respiratory diseases are particularly excessive.

THE AFTER-CARE OF THE CANCER PATIENT.

THERE are few more tragic figures in human life than the sufferers from malignant disease who daily present themselves for treatment in our hospitals. Apart from the few fortunate ones, in whom a cure is effected, their days will often be numbered; yet how often are they the most cheerful and courageous of patients. Any schemes for after-care, therefore, which shall make for a less distressing end should have a full measure of our sympathy. In the fourteenth report of the Cicely Northcote Trust (October, 1922–October, 1923), recently issued by the Almoner's Department of St. Thomas's Hospital, a lead is given in this direction. The cancer patient, unlike the phthisic, is often a person of middle age, and therefore often with a young family. Struck down in the years of greatest responsibility he must face the prospect of a long illness with an ominous prognosis. Someone is needed, therefore, who can "stand by," who will help the family to carry on and to make those readjustments to life which such a situation necessarily entails. And here the almoner gets her chance—and her privilege. The patient may return home from hospital with a wound to dress or with an inoperable secondary or recurrent growth to deal with, and in the end there may be a long struggle with secondary infection, hæmorrhage or bedsores.

A small booklet on "How to Nurse Cancer Patients,"[1] by the late matron of Chelsea Infirmary, recently published, well emphasises these points. Reading between the lines we can realise how the district nurse who sees the cancer patient in his last stages must improvise again and again to make bricks without straw in the homes of the poor. The Cicely Northcote Trust report also stresses this point; not only medical attendance, but nursing appliances such as hot-water bottles, bed-pans, air-cushions, draw sheets, mackintosh sheets, unlimited supplies of dressings, &c., are required. Very little imagination is needed to visualise the plight of these cases, and we wonder if the time has not come when no case of malignant disease shall be discharged from hospital without definite provision being made for after-care. Such provision would naturally fall under two heads: (1) Adequate arrangements for watching and following up the successful operation cases in view of the possibilities of recurrence; (2) suitable preparations for the last painful months of the inoperable case who will require careful nursing—preparations which must envisage all the possibilities of sepsis, secondary hæmorrhage, and the like. In these matters we might follow the lead of the after-care workers of maternity, child welfare, and tuberculosis schemes, in which departments much valuable work is now being done. It is possible also that a systematic after-care scheme for patients with malignant disease might ultimately produce useful statistics as to complications and sequelæ, duration of life, and even errors of diagnosis. At present we class all these patients together in one group as cases with a hopeless prognosis, whereas careful following up might shed a new light on some of these questions. In this matter medical officers of

[1] How to Nurse Cancer Patients. By E. S. Barton, R.R.C. London: The Scientific Press, Ltd. 1s. 3d.

Poor-law institutions could help. Many cases—notably those after colotomy operations—are transferred from the general hospitals to the infirmaries, and some scheme of collaboration through the hospital almoners might be developed. Finally, the following-up process should be correlated with the new statistical and economic researches on causation. In this matter we believe much more use might be made of the almoner's department than is done at present.

THE FUNCTIONS OF MUCOUS SECRETIONS.

THERE have always been arguments and controversy concerning the function of mucous secretions. The case of saliva is particularly interesting; some physiologists regard its function as mechanical, assisting the passage of food down the upper part of the alimentary tract, others hold that the starch-splitting qualities are by far the more important. Unfortunately for the latter view it is well known that diastase will only digest cooked starch, and since animals (and for that matter primitive man) do not have opportunities for cooking their food, it seems that the diastase can have but little function. In an address which we summarised last week Mr. W. Stuart-Low raises the cognate question of the function of the mucous surfaces and secretions of the nose, throat, and ear. He calls attention to the value of visceral secretions in holding up bacteria. The majority of workers will certainly agree with him so far, but they may not be inclined to put so much faith in the purely chemical action of mucin. Mr. Stuart-Low claims that this substance possesses chemical properties which render it specially objectionable to bacteria. It is pointed out that mucin is rich in oxygen and sulphur, and that it contains a glucosamin radicle, properties which, it is suggested, are in a way anti-bacterial. But a large number of other proteins are rich in oxygen, all the higher ones contain glucosamin, and practically every one contains sulphur. Again, the proteins, considered as a group are unreactive, and mucin is no exception to this. Bacteria are cultured on protein media, the majority of which contain an appreciable quantity of gluco-proteins, such as mucin. So far, then, as our present knowledge goes, the functions of mucin are sufficiently explained in Mr. Stuart-Low's other suggestions—namely, that the bacteria are "trapped" by the sticky secretion, and when thus rendered helpless are demolished by phagocytes.

SURRA OF HORSES AND BAYER "205."

Dr. F. K. Kleine's visit to this country, in order to lay his African experiences before the Royal Society of Tropical Medicine (see p. 384), will quicken the general interest in trypanosome diseases and their relief. To Dr. Kleine's own work we shall return later. The present position is well set out in a careful research on the treatment of surra in horses in Java, recently reported[1] by E. Rodenwalt and J. B. Douwes. They remark that the experimental treatment of trypanosome diseases shows an uninterrupted series of disappointments. Drugs which did well in Europe, curing laboratory animals, laboratory infected with laboratory strains of blood parasites, have disappointed expectations when used in the treatment of the natural disease in the tropics. Bayer "205" gave encouraging results in the treatment of dourine in Europe, though obstinate cases were found and some races of the parasite became resistant. However, dourine is not carried by an insect, but rather in a manner comparable with a laboratory infection, so it cannot be taken closely to resemble the tropical infections. The authors have been examining during two years the treatment of surra in horses by Bayer "205" and observe that only their negative results are final, the positive being still liable to further examination. Only those animals are to be considered—e.g., horses—whose trypanosomiasis takes an acute form, others (buffaloes) which have the disease in a chronic form are apt to mislead for what is judged to be a cure may prove to be only a remission. Horses generally become acutely ill and die in a few weeks. The authors lay stress exclusively on their treatment of naturally infected cases, as many remedies have been known to cure animals artificially infected while failing on the others. They insist on the importance of daily observation of temperature and blood (and that by an expert), for otherwise relapses are missed, and on the duty of keeping the animals throughout the experiment in fly-proof stalls to avoid dissemination of the infection. Fifty per cent. of horses suffer severely from the injection of Bayer "205," equally if they are healthy or infected, native-born or Australian, and even if the doses are very small, too small to be curative. But the trypanosomes are speedily affected, even in a quarter of an hour, disappearing from the blood in 12 hours, and meanwhile losing their power of reproduction. As the horses varied much in susceptibility they were always treated in pairs. It was concluded that the doses affecting the horse and killing the trypanosomes were unpleasantly close together, so big sterilising doses could not be given, the large dose was 2½ per cent. of the body-weight, small doses were ½ per cent. of the body-weight every other day till 5 or 7 per cent. had been administered (in 10 per cent. solution). The large dose may kill the horse, the small one is much less effective. Neither does any good if the disease is well established; they are only profitable if the pyrexia is but slight and there are no parasites to be found in the blood as yet. The disease is so far mastered if the horse does not die at once, but has a relapse after a remission; but relapsing cases are incurable. Ten artificially infected horses, not treated until the disease was well developed, all died. Fourteen naturally infected, all but three died; two are working, one would be, but is too vicious. That a horse is working does not prove it is not a carrier, hence the need for daily controls. Bayer "205" persists longer in the blood than any previous trypanocide, hence its usefulness in prophylaxis. If surra is found among the horses of a regimen the following programme is carried out: (1) Kill all horses seriously ill; (2) treat by injection all animals only slightly affected; (3) kill all relapsing cases; (4) all exposed still healthy animals get a prophylactic injection of ⅔ per cent. of body-weight; (5) horses who become ill are dealt with under (2) or (3); (6) repeat (4) in four weeks' time; (7) buffaloes must also be dealt with; (8) all under treatment are kept in fly-proof stalls. The trypanosomes, if not killed, become resistant within 20 minutes, and are more and more resistant in each succeeding relapse. So the ideal trypanocide is still to seek.

[1] Archiv für Schiffs- und Tropen-Hygiene, vol. xxvii., No. 9.

INSULIN BY THE SKIN AND MOUTH.

THE announcement by the Medical Research Council of a 50 per cent. reduction in the retail price of insulin brings the day nearer when this biological will be readily available for study and research. Recent investigations by Dr. A. Wallgren[1] in Gothenburg would seem to suggest that when insulin is rubbed into the skin, enough of the drug is absorbed to affect appreciably the concentration of sugar in the blood. He experimented with the small tablets each containing one Toronto unit of insulin, prepared by the Leo firm of chemists in Helsingborg. The tablets were pulverised, and the powder was first suspended in distilled water. This suspension was then incorporated in a little vaselin or lanolin ointment, and was slowly rubbed into the skin for a few minutes after it had been carefully cleaned with ether. The concentration of sugar in the blood was determined by Bang's method before the inunction of insulin, and for six hours after it, at hourly intervals. The persons examined were children between the ages of 1 and 15 years, convalescent from various diseases. They were given no food during these

[1] Upsala Läkareförenings Förhandlingar, 1924, xxix., 57.

ests in order that alimentary influences should not onfuse the issue. Control tests were also carried ut with lanolin inunction alone, and little or no liminution of the sugar content of the blood in these ontrol cases was observed. As a table showing he influence of insulin inunction in six children learly proves, insulin is easily absorbed by the ntact skin, the action of the insulin, as judged by he concentration of sugar in the blood, being greater n infants than in children of more advanced years. This may be so because the absorptive capacity of he skin declines with years, or because the dose of nsulin relative to the weight of the children was comparatively high in the youngest children examined. n the case of an infant only 1 year old, and veighing 9 kilos, the inunction of insulin reduced he concentration of sugar in the blood so effectively hat the experiment had to be discontinued prenaturely. Before the inunction the concentration of sugar in the blood was 0·094. The corresponding igures for the following six hours were 0·088, 0·073, 0·075, 0·057, 0·055, and 0·049. When this last igure was reached there were signs of a hypoglycæmic reaction, and the infant, who had reacted promptly to the first withdrawals of blood, became more and more indifferent to them. When she was given grape-sugar by the mouth, she at once became brighter and more lively. Experiments on the same lines were also conducted in a case of severe diabetes n a three-year-old child. It was found that the usual morning injection of insulin (2 units) could be satisfactorily replaced by the inunction of 20 units. Dr. Wallgren is inclined to regard these investigations as of speculative rather than of practical value, at any rate for the present. For the percutaneous administration of insulin requires so much of this drug to be effective that the cost of treatment would n most cases be prohibitive. A further disadvantage of the percutaneous route is the comparative inaccuracy of the dosage. But considerable interest attaches to the demonstration of the ability of a hormone to pass through intact skin. In another paper, published by Dr. Ernst Salén,[2] of Sweden, some promising experiments with the oral administration of insulin are recounted. He was unable to confirm the observations of L. B. Winter, who found that when insulin was given by the mouth in an alcoholic solution to rabbits considerable quantities were absorbed in a potent state. But when Dr. Salén gave insulin by the mouth in a suspension of olive oil to three patients suffering from diabetes, he found that in two cases there was an appreciable reduction in the blood-sugar. These and similar investigations afford some grounds for hoping that we may in the near future dispense with the administration of insulin by subcutaneous injection.

WE regret to announce the sudden death, on Sunday, Feb. 17th, of Mr. R. G. P. Lansdown, consulting surgeon to the Bristol General Hospital.

Dr. A. C. O'Sullivan, professor of pathology in Dublin University, died on Feb. 18th from sepsis, contracted a few days before in the course of making a post-mortem examination.

THE anniversary dinner of the Medical Society of London will be held at the Grand Hotel, Trafalgar-square, London, on Wednesday, March 12th, at 7.30 P.M., Dr. Herbert Spencer, the President, in the chair.

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[2] Acta Med. Scand., 1924, lx., fasc. 1.

NEW HOSPITAL AT ALDERLEY EDGE.—Lord Sheffield, on Feb. 13th, opened a new district hospital at Alderley Edge. The hospital is provided with both public and private wards, and was built by funds left by the late Mr. Otto Baerlein, for many years Serbian Consul in Manchester and a resident in Alderley Edge. The cost of building and equipment was about £11,000.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LIX.—THE TREATMENT OF NEPHRITIS.

I.—General Principles.

THE treatment of nephritis is by no means very satisfactory, and it may be said at once that no drug has any direct beneficial influence on renal lesions. The therapy of renal disease resolves itself into the usual more or less empirical treatment of the various symptoms that may arise; the fundamental lesion itself is unaffected by medicinal measures. While the treatment of symptoms is a simple enough procedure, certain principles underlying the treatment of the disease are still the subject of much controversy and difference of opinion. Though it is quite impossible in the light of our present somewhat limited knowledge to pronounce any definite opinion on certain of the principles advocated in the treatment of renal disease, it is nevertheless clear that physiological considerations may help us in our endeavours to arrive at correct conclusions.

Diet.

The most important question that arises in the treatment of every case of nephritis is that of suitable diet. In the days when physiology was just beginning to explain certain functions of the animal body, it was supposed that protein was partly broken down in the intestine, but that, on absorption, a resynthesis took place, with the result that protein as such was directly passed into the blood. As it was well known that in nephritis protein was excreted by the kidney, the natural deduction was that the less protein given as food, the less work would be thrown on the kidney in excreting this protein. This was the principle underlying the conception which still in large measure prevails, that protein should be given but sparingly in all cases of nephritis. Modern physiology, however, teaches that protein taken as food does not increase directly the protein of the blood, but that food protein is first broken down to the stage of amino-acids in the intestine, and as such is absorbed and circulated in the blood; these amino-acids are picked out of the blood by the various tissues and rebuilt into proteins as required. From this it might be expected that increase in protein food would not increase the amount of protein excreted in the urine in nephritis. Investigation shows that this surmise is correct: the amount of protein excreted in renal disease is not dependent on the amount taken in as food, and no increase or decrease of albuminuria can be brought about by changes in the protein content of the diet. It is therefore clear that no clue as to the amount of protein that should be given in the food can be obtained from an estimation of the amount of protein passed in the urine. On the other hand, it is clear that the more protein taken the greater will be the amount of nitrogenous waste products formed. These products, the chief of which are urea, uric acid, and creatinin, have to be excreted, and in this way their presence may act detrimentally on the kidney, so that in certain conditions limitation of protein may be beneficial.

It should be remembered, however, that there is no proof that protein food is in any way injurious to the kidney, and the usually accepted doctrine that protein is detrimental requires investigation in the light of modern physiological teaching. While it is only common sense to affirm, in the present state of our knowledge, that protein may be injurious in certain cases of advanced renal disease, it is certain that there are numerous cases of nephritis in which the practical withdrawal of protein from the diet does much harm. It is not likely that protein food can produce any injurious effects if the renal con-

dition is such that the kidneys are quite capable of excreting nitrogenous waste products. Frequently certain symptoms of renal involvement are present, but investigation on modern lines shows that there is no interference with the function of excreting waste nitrogenous products. In such patients, protein food may be given with impunity; indeed, these patients frequently improve when given a reasonable amount of protein food, and it is sometimes necessary to include what might be regarded as excessive amounts of protein in the diet. The question of the most suitable diet in any case of nephritis must therefore depend on the state of the kidneys and their power to excrete nitrogenous waste products. If this function is good, protein may be given in whatever amount is considered necessary; if, on the other hand, there is a tendency for the retention of waste products in the blood, it is probably better to limit the amount of nitrogenous food. Everything depends on the nature of the particular case under review, and no general rule can apply to every case. This point will be discussed in greater detail below.

Salt-free Diet.—Many medical men endeavour to restrict the salt intake in all patients suffering from nephritis, but as far as we know at present, there is no sound reason for this procedure unless œdema is prominent. This is the one and only symptom that indicates a diminution in salt intake; the indiscriminate use of a salt-free diet in other cases simply causes inconvenience to the patient and adds greatly to his general discomfort. In many cases of nephritis salt is exceedingly well excreted; when this is not the case, a certain amount is retained in the body. Since it is impossible for the tissue cells to survive if the concentration of salt becomes too great, the body retains water to bring down the concentration to that normally present in the body. Obviously, this mechanism results in the production of œdema. It is not argued, of course, that the sole cause of œdema in nephritis is necessarily salt retention; other factors undoubtedly play a part, but the well-marked diminution of œdema in response to salt-free diet, so often seen in suitable cases, proves that salt retention is, at any rate, frequently a most important actor in the production of œdema in nephritis.

The Blood Pressure.

Attempts to lower the increased blood pressure in chronic nephritis are frequently made, and many methods are used. In my experience no benefit is obtained from such procedures, and in general it would seem that no specific attempt should be made to lower the increased blood pressure of chronic nephritis. This rise of blood pressure undoubtedly serves a purpose, and when it is a secondary symptom dependent on renal change, attempts to lower it may upset the renal excretion. Lowering of the blood pressure by artificial means does not in any way improve the renal function. Indeed, in some patients it would appear as if the increased blood pressure was a most important factor in assisting the diseased renal tissue to perform its function, and when the blood pressure is artificially lowered such patients do not always feel so well. It is often very difficult to affect this raised pressure by therapeutic means, and, on the whole, this is perhaps fortunate for the patient.

Fluid Intake, Œdema, and Diuretics in Nephritis.

It is a common practice to give large amounts of fluid in many cases of nephritis with the idea that the increased flow of urine induced will result in washing out toxic products. Obviously, when œdema is a marked feature, such a procedure can only result in making the condition worse. It is questionable whether large amounts of fluid should ever be given in nephritis. In acute nephritis certainly this practice is contra-indicated, for here we are really dealing with renal cells so extensively damaged that they are for the time being more or less unable to excrete water. No amount of water introduced into the circulation will help to promote renal secretion until the cells recover somewhat, and since in severe cases the body already contains an excessive amount of fluid, the introduction of more fluid simply results in an increase of the œdema. When the renal cells recover and are again able to secrete appreciable amounts of urine, there is practically always more than sufficient fluid in the tissues. The conditions for secretion of urine at this stage are ideal, since the excess of fluid present is practically always associated with more or less increase in the blood pressure; at the same time there is an excessive amount in the blood of urea, which is perhaps the best diuretic we possess. All that is required to produce diuresis, then, is an efficient renal mechanism, and when, therefore, the kidney cells recover, marked diuresis usually takes place, and both fluids and toxins are eliminated. This desirable result, however, cannot be expedited by giving fluid, and there does not appear to be any condition, either in acute or chronic nephritis, in which the introduction of large amounts of fluid into the system is indicated. Indeed, in certain subacute cases when œdema is a prominent feature, reduction of the fluid intake frequently exerts a most beneficial influence. Incidentally, the experience of everyone who has carefully investigated this problem is that the usual diuretics give practically no beneficial result in patients in whom œdema is directly dependent on renal lesions. That marked diuresis frequently follows the use of diuretics in acute nephritis is acknowledged, but since diuresis is the usual outcome in this condition when recovery of the renal cells takes place, it cannot be held to depend on the use of diuretics. It must be remembered that in all severe cases of acute nephritis there is ample diuretic substance—urea—already present in the blood. Contrary, therefore, to what is perhaps the generally accepted opinion, the ordinary diuretics are of little or no value in renal disease, and their use is, with few exceptions, not indicated.

The Use of Alkalies.

In recent years much work has been carried out on so-called acidosis, and since certain features of acidosis are encountered in renal disease, it became the custom some time ago to give alkali in many cases of nephritis. While there is little evidence that the usual small doses of such alkalies as sodium bicarbonate can do any harm when given by mouth, their injection directly into the circulation, in severe conditions of nephritis, is of no value, and indeed sometimes produces alarming results. The particular form of acidosis present in nephritis cannot be counteracted by the use of alkali, since the condition depends on a defective function in the renal substance. The diseased kidney is unable to excrete the excess of alkali, with the result that it is retained in the system, and, like salt, results in the retention of water and an increased œdema. In this connexion it is worth noting that Sellard's simple test for acidosis is of little value in nephritis. Sellard showed that a patient suffering from acidosis could take large amounts of alkali by mouth without the urine becoming alkaline, while the normal individual generally passes an alkaline urine after taking such a comparatively small amount as 5 g. of sodium bicarbonate. Frequently, nephritic patients can take large amounts of sodium bicarbonate without passing an alkaline urine; this, however, merely indicates that the kidney is unable to pass the alkaline sodium bicarbonate into the urine, and provides no evidence whatever of true acidosis. When real acidosis is present the sodium bicarbonate is neutralised by the excess of acid in the body, and so the urine does not become alkaline until the whole of this acid is dealt with. It is because Sellard's test has often been used in nephritis, and the results quoted as indicating acidosis, that the correct interpretation of the results must be insisted on.

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(To be concluded.)

Special Articles.

THE WORK OF THE RADIUM INSTITUTE.

THE annual report of the Radium Institute, London, for the year ending Dec. 31st, 1923, has just been issued. We outline here several of the most important features of the report, which deals in particular with radium therapy in diseases of the thyroid, thymus, spleen, and lymphatic system.

Recent Developments in Radium Therapy.

The provision of a limited number of bedrooms in the Institute for the reception of in-patients has proved of very great value. Their existence has rendered possible the carrying out of many surgical procedures which are essential to efficient radium therapy, and, further, it has enabled treatment to be given in a shorter time and with a minimum of fatigue or discomfort. The services of the surgeon are being requisitioned more frequently for the purpose of employing radium in the most effective manner, and recently reported advances in that direction comprise the treatment of laryngeal growths by subhyoid pharyngotomy; and of inoperable cancer of the uterus with extensive infiltration of the broad ligaments, by performing a medium laparotomy and burying the radium tubes in the diseased tissues from the peritoneal surface. Cases of carcinoma of the cardiac end of the œsophagus have also been treated by the introduction of radium tubes through a gastrotomy opening. It appears highly probable that the use of "*surgery of access*" will undergo a steadily progressive development.

The combination of diathermy with radium has, during the past 12 months, yielded some highly successful results in the treatment of carcinoma of the tongue, mouth, tonsils, and fauces, many cases of very advanced type being greatly benefited, the suffering much relieved, and the progress of the disease retarded or arrested. The customary procedure consists of the removal or destruction of the primary focus of the disease by diathermy, excision of the more easily accessible associated lymphatic glands, and a subsequent general radiation of the whole operation area with radium tubes and applicators.

The general trend of radium therapy is in the direction of increase of dose, more especially at the first exposure, and the employment of quantities of radium element varying from 250 to 750 mg., with screening of 2 mm. of lead, and exposure of from 20 to 30 hours' duration, is now by no means unusual in the treatment of such conditions as an extensive mammary cancer, mediastinal growths, lymphosarcoma, lymphadenoma, and lymphatic leukæmia. Patients so treated do experience some degree of systemic disturbance, but it is never very great, and rapidly disappears under appropriate treatment. It is not, however, wise to use such a heavy dose when the radiation is directed chiefly to the abdominal cavity, as recent experimental researches have shown that the mucus-forming cells of the intestines are peculiarly susceptible to gamma rays. The immediate effect of such radiation is a definite but transient increase of activity of the goblet cells, speedily followed by atrophy and degeneration. No mucus being formed the intestinal bacteria are enabled to invade the mucosa, causing its necrosis and desquamation. The bacteria may in some cases penetrate into the blood-stream and give rise to a septicæmia.

Radon.—The use of radon[1] is steadily increasing as its therapeutic value becomes more widely known and appreciated. Advice is freely given to medical practitioners in the treatment of disease with radon apparatus, and if precise information is furnished as to the nature and extent of the disease or growth, a suitable apparatus, correctly screened, with full instructions as to technique and exposure, can usually be forwarded to any address in the British Isles within two or three days. The fact that the therapeutic effect of radon and radium salt apparatus is identical cannot be too strongly emphasised. It is true that radon slowly decays, its initial radioactivity being reduced to one-half in 3·85 days, and to one-fifth in 8·8 days; but this rate of decay never varies, and it is thus a perfectly simple matter to prepare an apparatus, the mean activity of which during a period of 24 hours, would be exactly equivalent to that of a radium salt apparatus of a stated strength. Radon, moreover, has one particular advantage over radium salts, being a gas it is highly compressible, and a curie of radon (the amount of radon in equilibrium with a gramme of radium element) can be contained in a space of only 0·58 c.mm. This property permits of the manufacture of extremely small radon tubes or applicators, possessing a very intense radon activity. Further, radon possesses no intrinsic value, and should a radon applicator be mislaid or destroyed, the only pecuniary loss incurred is the value of the metal container. This enables radon apparatus to be sent on hire or loan to all parts of the United Kingdom, no security or insurance being demanded, as would be the case if radium salt applicators were used.

The Value of Radium in Diseases of the Thyroid.

The normal thyroid gland is but little affected by radium rays, and radium therapy is of doubtful value in the treatment of simple goitres and should never be regarded seriously as an alternative to surgery. In the soft parenchymatous type, however, it may be used with a certain amount of justification, if operative measures have been negatived for any reason.

While in suitable and selected cases of *exophthalmic goitre* the operation of partial thyroidectomy is undoubtedly the procedure offering the best prospects of permanent relief or cure, many patients emphatically refuse operation, and radium treatment is advised.

Prolonged irradiation with the gamma rays often proves most beneficial, especially if there is no vomiting or diarrhœa, and the patient is not emaciated. Flat applicators containing from 70 to 100 mg. of radium element screened with 2 mm. of lead are employed, and a total exposure of from 20 to 30 hours' duration given. The treatment is sometimes followed by a definite exacerbation of all the symptoms, and it seems fair to attribute this to the congestion attendant upon the reaction, causing an increased outflow of the thyroid secretion into the blood-stream. Such exacerbation, however, proves transient, and is usually followed by a gradual but steady and definite improvement in the patient's symptoms and general condition, and this may probably, almost certainly, be ascribed to the action of the rays producing an arrest of the vitality and retardation in the development of actively proliferating cells, thus restoring the output of the cellular secretion more nearly to normal limits. With this there is also associated a fibrosis of the connective tissue of the gland, causing the organ to become firmer and smaller. The patient should be seen at intervals of three months, and the treatment repeated, if necessary, with such modification as may seem advisable.

In advanced and inoperable cases of *malignant goitre* radium treatment should most certainly be adopted. It will often arrest the progress of the disease in a most striking fashion, causing a great reduction in the size of the growth and affording much relief to the symptoms.

The treatment should be carried out by "cross-fire" irradiation with external applicators containing 150 to 250 mg. of radium element, screened with 2 mm. of lead. Exposures of 30 hours' duration repeated at intervals of six weeks are necessary. The employment of radium tubes buried within the growth is strongly to be deprecated, as this procedure is almost inevitably followed by a rapid fungation of the growth through the skin incisions. It is important to preserve the surface of the skin intact as long as possible, as the presence of fungation and ulceration adds greatly to the patient's distress.

[1] In the report of the International Committee on Chemical Elements, 1923, it was advised that the word "radon" should replace the term "radium emanation." The initial activity of all radium emanation apparatus is expressed in millicuries. A millicurie is the amount of emanation in equilibrium with a milligramme of radium element.

When the existence of an enlarged *thymus gland* is suspected a definite diagnosis should be made and treatment carried out by a "cross-fire" radiation of the area with flat applicators containing 50 to 100 mg. radium element screened with 2 mm. of lead should be adopted. The total exposure should be of from 15 to 20 hours' duration, preferably given in three or four equal periods on successive days. The gland rapidly shrinks and a second series of exposures is rarely, if ever, necessary.

Indications for Radium in Enlargement of the Spleen.

Chronic enlargement of the spleen from congestion is met with in hepatic cirrhosis and in chronic cardiac and pulmonary affections. It also occurs in certain constitutional conditions, syphilis, rickets, malaria, and lardaceous disease, but in none of these affections is radium therapy of any practical value. There are, however, three diseases in all of which there is great enlargement of the spleen, and in which radium treatment is indicated, as it rapidly induces a considerable shrinking in the size of the organ with an associated improvement in the patient's general condition.

1. *Splenomegaly—Simple.*—The effect of radium radiation in a case of simple splenomegaly is usually very striking. A spleen which before radiation reaches down into the left iliac fossa rapidly recedes under appropriate dosage, and at the end of six weeks or two months may not be palpable below the costal margin. The radiation of the enlarged organ is best accomplished by means of numerous "half strength" flat surface applicators containing from 200 to 400 mg. of radium element, screened with 2 mm. of lead, the total exposure being of from 20 to 30 hours' duration.

2. *Splenic Anæmia—Banti's Disease.*—In this condition radium usually induces a definite decrease in the size of the spleen, with some slight improvement in the colour index. The disease is, however, a steadily progressive one, and the remission usually proves but temporary, a repetition of the treatment being called for at intervals of from four to six months. Radiation is carried out with "half strength" surface applicators, screened with 2 mm. of lead, and total exposure of from 20 to 30 hours. The amount of radium employed varies with the size of the spleen, but generally quantities of from 100 to 200 mg. of radium element are necessary.

3. *Spleno-Medullary Leukæmia.*—Radium is unquestionably of great value in the treatment of spleno-medullary leukæmia. The immediate result in the improvement of the blood condition is very remarkable. It is often possible to record a definite decrease in the white cell count three days after the termination of the exposure, and this decrease may be steadily maintained for four or five weeks, at the end of which time the number of leucocytes may be reduced to between 20,000–50,000 per cubic millimetre. There is usually, in addition, a concomitant rise in the hæmoglobin content, the anæmia is lessened, and the tendency to hæmorrhages diminished. The patient's general condition is also improved, appetite and strength returning. If the disease is of comparatively recent origin, there is a great decrease in the size of the spleen, the organ rapidly shrinking to almost normal dimensions, and permitting the performance of splenectomy, if this be considered desirable. If the condition is of long standing, and the spleen has previously been subjected to much treatment with X rays, but little actual decrease in its size is likely to be effected by radium, as extensive fibrosis of the splenic interstitial tissue will have taken place. The radiation employed in the treatment of spleno-medullary leukæmia should be wholly of the gamma type. "Half strength" flat surface applicators, screened with 2 mm. of lead, are used, and containing from 100 to 400 mg. of radium element according to size of the spleen. The total radiation should be of from 20 to 30 hours, and, when possible, this should be spaced over two or three days, as by so doing the possibility of inducing some slight systemic disturbance is much lessened. The patients need to be kept under careful observation and periodic examinations of the blood should be made. A steady progressive increase in the leucocyte count should be regarded as an indication for further radium treatment. This is, however, rarely necessary at lesser intervals than four months, and in favourable cases a period of six or nine months may elapse between exposures. In very advanced cases accompanied by severe anæmia transfusion of blood may advantageously be employed between the radium treatments.

Effects of Radium on Certain Lymphatic Affections.

The action of radium rays in the treatment of *tuberculous adenitis* is probably of a two-fold character. Numerous experiments have been made with regard to the action of radium rays on tubercle bacilli, and it has been found that exposures of at least 100 hours' duration with full strength applicators unscreened are necessary to produce a lethal effect. Such exposures are outside the range of practical therapy, and for this reason radium irradiation cannot be used for the distinct purpose of killing tubercle bacilli. It has, however, been noted that cultures of tubercle bacilli which have received a relatively short irradiation have their vitality greatly inhibited, and that sub-cultures made from them grow much more slowly than controls, and exhibit numerous involution forms. It is probable, therefore, that the radiation of tuberculous glands weakens the vitality of the contained tubercle bacilli and enables their destruction to be more readily accomplished by the phagocytic cells. Further, the radium irradiation acts as a stimulus to the production of fibroblasts with the consequent development of an encircling, constricting, and protective fibrosis

In the early stages of the disease, when the glands are relatively small, discrete, and but little tender, appropriate radium treatment will usually speedily reduce their size and number and arrest the progress of the disease. If caseation or suppuration has occurred, it is, however, imperative that before radium treatment be given the contents of the glands should be removed, either by aspiration or free incision and drainage. Some judgment must be exercised in the treatment of tuberculous adenitis, and the strength of apparatus, screening, and length of exposure modified according to the nature of the individual case. When the covering skin is not implicated, "half strength" applicators, screened with 2 mm. of lead, and exposures of from 20 to 30 hours' duration give the best results; but when chronic sinuses exist and the skin is infiltrated or ulcerated, screening of 1 mm. of silver or 0·1 mm. of lead is preferable, the length of the exposures being shortened accordingly.

Lymphadenoma usually exhibits an exceedingly favourable response to radium therapy, more especially when the superficial glands only are affected and no enlargement of the spleen, liver, or mesenteric glands is appreciable.

The position of the enlarged glands generally renders the application of "cross-fire" radiation practicable, and if this method of treatment be conducted with suitable sized "half strength" applicators, screened with 2 mm. of lead, and exposures of 20 to 30 hours' duration, the glands rapidly diminish in size and number, this effect being often clearly perceptible to the patients themselves within a week of the exposures. The duration of the remission varies very widely. In some cases the disease will remain quiescent for 12, 15, or 18 months, in others a repetition of the treatment may be found necessary at intervals of six months, but none the less radium treatment is to be advocated, as it will prolong the patient's life considerably, and postpone the appearance of a secondary anæmia and its accompanying symptoms.

It is in the treatment of *lympho-sarcomata* that the most spectacular results of radium therapy are to be seen. The lympho-sarcoma cell is peculiarly susceptible to gamma radiation and its degeneration rapidly occurs. The rapid degeneration and absorption of the lympho-sarcomatous cells, however, necessarily produces an auto-toxæmia, and the systemic disturbance is generally considerable, sickness, lassitude, headache, and a rise of temperature being pronounced features.

The patient should be kept strictly at rest, and laxatives and diuretics judiciously administered, until the symptoms have subsided. It is not necessary or advisable to treat lympho-sarcomata by the burying of radium tubes in the substance of the growths. The tumours exhibit a great tendency to fungation when once any breach of the covering skin has occurred, and for this reason the surface should be kept intact as long as is possible. "Cross-fire" radiation will do all that is required, and it is justifiable, in view of the extreme malignancy of the disease, to use a very large quantity of radium—400 to 700 mg. of radium element, screened with 2 mm. of lead, and a total exposure of 30 hours have been employed in some extreme cases with most gratifying results.

Radium treatment is very effective in improving the condition of the blood in *lymphatic leukæmia*. The lymphocyte is probably, almost certainly, the most susceptible of all cells to radium, and for this reason radiation of the enlarged glands is speedily followed by a very definite decrease in the total number and percentage proportion of the lymphocytes. With this fall there is usually associated an improvement in the general symptoms, and the patient's health is decidedly benefited. It is, however, extremely difficult to predict how long the improvement will last. In a few cases the disease will remain quiescent for a year or 18 months, but, as a general rule, indications of a relapse appear in between four and six months, and a repetition of the treatment becomes imperative. The ultimate prognosis is bad, but the adoption of radium treatment usually effects a considerable prolongation of the patient's life.

Treatment is administered by means of suitable sized "half strength" applicators, screened with 2 mm. of lead, and applied in contact with the surface of the affected glands. The total quantity of radium used is dependent upon the number and size of the glands treated, but generally amounts of between 100 and 300 mg. radium element will suffice. The total exposure should be of from 24 to 30 hours' duration.

Secondary Tumours.

The treatment of *secondary malignant growths of the lymphatic glands* is mainly surgical, most operations for the treatment of malignant disease being planned on a scale which provides for a wide removal of the associated lymphatics. In many cases, however, radium treatment is employed as an adjunct to surgery, a prolonged screened radiation being given over a wide surrounding area, with the two-fold object of bringing about the degeneration of any scattered or isolated foci of the disease, and of arresting the permeation of malignant cells through the lymphatics. When the removal by dissection of malignant glands is impossible or inadvisable, radium treatment may be adopted, as it will often cause a considerable diminution in their size and arrest the spread of the infection to neighbouring glands. When the masses are superficial, and in easily accessible situations, treatment with buried radium tubes, screened with 1·0 mm. of silver or 0·3 mm. of platinum, is to be advocated. When deeply situated, or attached to important structures, blood-vessels, or nerves, the prolonged screened radiation from "full strength" applicators is to be preferred.

It is impossible to lay down any hard-and-fast rule as to dosage; the amount of radium used, screening employed, and exposure given having to be adjusted to the requirements of the case. Speaking in general terms, however, when buried tubes are used the exposure should vary from 18 to 24 hours. When prolonged radiation from external applicators is adopted the screening should be 2 mm. of lead and the total exposure of from 20 to 30 hours. If benefit result, the treatment may be repeated at intervals of five to six weeks.

CHANGING FACTORY CONDITIONS.

III.—PROBABLE FUTURE DEVELOPMENTS.[1]

IN the welter of events and of emotions in which we have lived since the closing days of July, 1914, it has been difficult to say what would be lasting and what was merely passing, in relation to industry in particular as in relation to all movements of civilisation. Since the armistice we have had abnormal trade fluctuations. The colossal happenings of these years have bred new hopes, passing sometimes into sheer extravagances, as to industrial possibilities; and by a natural revulsion of feeling, many have been carried to the opposite extremes of reaction or despair. There are many signs now of a settling down to a less unstable state of affairs, and to reasonable ambitions and projects; and it is not entirely rash to forecast likely developments both of legislation and of administration, or to attempt to estimate the attitude and action of those engaged in industry, whether employers or employed.

General Need for New Legislation.

In the first place it is generally expected that a new and comprehensive Factory Bill will be brought before Parliament at the first good opportunity. Twenty years form a long period, especially when they are years in which experience has grown and views have changed. The Factory Act of 1901 no longer seems adequate.

One of the first things to consider in connexion with any new Factory Act should be whether there are any new classes of workers to be brought within its scope. At present warehousemen have very little protection; and clerks have none at all, beyond that which the ordinary by-laws as to sanitation impose upon any building used by human beings. It is notorious that both warehouses and offices can be most unwholesome places to work in. Protection should certainly be extended to both clerks and warehousemen, though it is not at all sure that it would best be done by widening the scope of the Factory Acts to include them, or whether such inclusion would be welcome to those who conduct office business. What is important is that the occasion of the introduction of a new Factory Bill should be taken to review the protection of all workers. Our industrial legislation has grown up piecemeal as different abuses have been perceived or different classes of workers have attracted attention and sympathy; the time has come to build more systematically. There is no reason why a man who paints the bottom of a ship or a railway bridge should come under regulations intended to minimise the danger of lead poisoning whilst a man who paints a house does not. There is no reason for maintaining any longer the historic distinction between textile and non-textile factories. And there ought to be a frank abandonment of the old idea, half abandoned in practice but still leaving its traces all over our industrial legislation, that men do not need protection against industrial evils. The most glaring example is that of hours; men may, and sometimes do, work for terribly long periods at a stretch, notably at the docks. The existing Factory Acts, and the regulations drawn up under them, should be scrutinised to see which distinctions made in conditions imposed as to men and as to women are based on genuine requirements of different sexes, and which are survivals of the old notion that the State should not interfere with the employment of adult men. If it should be objected still that men are strong enough to force better conditions by trade-union action, whenever they really desire them, the answer surely is that their health and safety do not concern themselves alone but that the whole community has an interest in them. If from neglect of proper precautions the health of men in any industry, or of some of them, is injured, it is extremely likely that sooner or later they, or members of their families, will become a burden upon the community.

The Requirements of a New Factory Act.

One of the requirements of a new Factory Act would certainly be adequate lighting in all factories and workshops. And not only adequate lighting but *suitable* lighting, without dazzle or glare or flicker. The Departmental Committee on lighting reported very fully in 1915 and again in 1921, and it called attention to the legislation of foreign countries in this matter. There should be no great difficulty here; the main question would be to settle what should go into the Act itself, and what should be left to the Home Secretary to prescribe by regulation for the various trades and processes. The Departmental Committee recommended that the illumination in an ordinary workroom should be not less than 0·25 foot-candle on a horizontal plane at floor level; that

[1] The previous articles in this series appeared in THE LANCET of Feb. 9th and 16th respectively.

in other parts of factories or workshops it should be not less than 0·1 foot-candle; and in yards, approaches, and so on, not less than 0·05 foot-candle. In the case of iron foundries, in which the accident rate has been very high, they recommended an illumination of not less than 0·4 foot-candle. There is no great difficulty in measuring illumination by a photometer, and there is foreign experience to show that such definite standards are practicable. The gain to the workers both in health and in safety should be considerable.

Another requirement is the regulation of weight-lifting. Strains and ruptures are only too common among men, notably at the docks. It was the frequent occurrence of hernia among certain classes of workers at Bournville which led to the provision by the firm of special gymnastic training and instruction in weight-carrying, but few firms are so careful of their workers' welfare as Messrs. Cadbury. The bad effects of lifting and carrying heavy weights show themselves more often in general fatigue and over-strain than in definite accidents; as the Departmental Committee on Accidents phrased it, "it is a matter of health rather than of safety." The subject has received attention for at least 25 years past, but not much has been done. Some small protection is afforded by the law to women and young persons; in the case of the latter the certifying surgeons can attach conditions to the certificate of fitness; and both women and young persons are excluded from very heavy work in the pottery industry and in one or two other industries. But only the fringe of the evil has been touched. It must be admitted that legislation as to weight-lifting and weight-carrying would not be easy to enforce.

Further, a new Act should require the proper spacing of machinery. It should substitute also the "safe-guarding" of machinery for the present requirements of "fencing" and "guarding"; the former term is wider and would cover precautions which do not come under either of the latter heads, such as provision of automatic feeding arrangements. A clause is also wanted requiring the maintenance in good condition, both as regards repair and cleanliness, of all floors, passages, and stairways. Whether a new Factory Act should attempt to regulate the manufacture of machinery is more controversial; there would be difficulties connected with the import and export of machinery, and perhaps it is a matter which will have to wait for international action.

It was the distinctive feature of the Police, Factories, &c. (Miscellaneous Provisions), Act of 1916 that it gave the Home Secretary power to prescribe welfare conditions in industries which were not technically "dangerous." Those who frame a new Act will have to consider carefully what powers of this kind they want to allow. Is there any reason why the provision of hot water for washing purposes should not be made compulsory on all factories and workshops and for every kind of worker? It seems a very elementary hygienic need.

The present legal enactments are nowhere more thoroughly out of date than in provisions as to hours. They still allow a 10½-hour day and a 60-hour week to women and young persons in non-textile factories. (There are a good many exceptions and special provisions for special industries, but that is the broad rule.) Industrial practice is far away from what is allowed, and a 48-hour week or a 44-hour week are most commonly worked to-day. But they should not be left to the power of the trade-unions to enforce or to the goodwill and the good sense of the employers to allow. The community should register its unwillingness to tolerate long hours. Moreover, this country ought to ratify the first convention of the first meeting of the International Labour Organisation of the League of Nations, which specified an eight-hour day and 48-hour week as a normal legal maximum.

International Organisation: the Power of Research.

Industrial legislation and administration in this country, and in all other civilised countries, are likely to be profoundly affected by the new International Labour Organisation, unless indeed the League of Nations fails to establish itself—a contingency which is better not contemplated. The steady comparison of the legislation of different countries is bound to result in levelling up; each country will doubtless be anxious to press upon other countries the adoption of restrictions which they have placed upon their own manufacturers. Concerted action should also make possible legislation in some directions in which the separate nations have feared to move because of competition; there have been one or two conspicuous examples in the past of what is possible to united action, notably the proscription of white phosphorus and the prohibition of night work of women; and now with properly constituted and permanent machinery much more should be achieved. We must reckon, however, with the possibility that the existence of the International Labour Organisation may act also to some extent as a brake; nations may not be quite so ready to make experiments in advance of other nations, and the opponents of innovation will be able to suggest, with rather more case, that we ought to wait for other countries to take action also.

It is impossible to over-stress the importance of research and the benefits which might accrue to the workers in industry if money were spent more freely on it. It is encouraging to note, as the Chief Inspector of Factories notes in a recent annual report, that trade associations are spending a good deal more in this direction than in the past. There is also the important work of the Medical Research Council, which might, of course, be multiplied many times with advantage. The coöperation of medical men and of industrial chemists has accomplished much in the past, and there is vastly more which it is likely to achieve. A very valuable sphere of research just at present is the causation of dermatitis in its many forms. Sugar-workers, oil-workers, women who peel oranges, men who handle box-wood, and many others, are liable to affections of the skin, which may be more annoying than serious, but which may in some cases have very serious consequences. It is important, and not always easy, to discover exactly which volatile oil or other ingredient is the cause of the mischief and what the precise action is. Until that is known, precautionary measures may either fail or they may be unnecessarily cumbersome and vexatious. There is also much experiment still needed on substitutes for dangerous materials. Phosphorus poisoning has disappeared, or almost so, not because of elaborate regulations hedging its use, but because it was found possible to prohibit altogether the use of white phosphorus. In the same way it would do more for the health of certain classes of workers—e.g., coach-painters and house-painters—if the use of lead in paint could be prohibited; but there is still a good deal of work to be done before we can tell definitely to what extent zinc compounds or other substances can replace lead compounds and give as good service. Along all such lines research undertaken in different countries would have the advantage of pooling varying experiences of the troubles and varying methods of meeting them.

The same may be said of ventilation. Here, where there is distinct room for great reform, there seems to be a shortage of men with expert knowledge. The removal of steam from dyeing sheds is often a difficulty as to which employers would welcome advice. Great progress has been made of recent years in the removal of dust and fumes, and there is reason to believe that we are on the threshold of further improvements of far-reaching effect. Dr. J. S. Owens's Dust Counter,[2] which enables us to take an exact measure of the solid impurities in the air, may well make a revolution in the health of some of the grinding trades. The difficulty here has been to make both employers and workpeople realise the dangers arising from the presence in the atmosphere of minute and invisible particles of silica. Because no

[2] THE LANCET Supplement on Atmospheric Pollution, June 13th, 1919.

dust could be seen, they assumed that there was no dust to do any harm. But it is precisely the invisible particles of silica which penetrate to the lungs and cause fibrosis. It is now possible, without excessive difficulty, to demonstrate the presence of injurious dust in a room which appears to be dustless, and to give a reasonably exact account of its quantity and composition.

The Need for Standards.

Attention should be drawn to the growing requirement of exact measurements in industrial legislation. Subjective standards such as "adequate," "reasonable," "suitable," are being replaced in many directions by precise objective standards. Examples of this are to be found in the Cotton Cloth Factories Acts, with their standards of humidity measured by hygrometers, in the regulations for wool-sorting which prescribe the velocity of exhaust draught for various purposes, in the regulations for spinning and weaving flax which fix a minimum permitted temperature. The recommendations of the Departmental Committee on Lighting are another case in point. Perhaps one of the weakest places in our system of industrial regulation is the lack of standards of competence for men who are placed in responsible positions. The Coal Mines Acts require that managers and other officials of coal-mines shall have passed examinations and shall hold certificates that they are fitted for their work. Similar safeguards would be very useful in many other industries. There is nothing at present to guarantee that a man who undertakes the responsibilities of an industrial enterprise has the technical knowledge necessary for his task. There have been cases of collapse of buildings in the last year or so where it was clear that structural alterations, or alterations in use, were made by men who did not understand their work. One disastrous explosion not long ago was obviously due to the same cause. The health and safety of the workers ought not to be jeopardised in this way. The chief difficulty at present is the lack of recognised and well-graded diplomas or other guarantees of competence in the majority of industries.

The General Message.

The greatest progress in industrial welfare is to be made, not in reducing the diseases or the dangers special to some of the more objectionable processes, but in raising the standard of health and well-being of the ordinary worker at ordinary jobs. Even in the case of the specific industrial diseases, half the battle has been to get the ordinary rules of health observed. It was not simply lead poisoning which caused such a huge sickness and fatality list 20, 30, 40 years back; it was the exposure to lead of men and women, often of children, who were underfed, over-tired, and ignorant of many of the common decencies of life. The higher standards of life generally have done a great deal, quite apart from the effects of special regulations, to reduce industrial disease.

The use of hot water, care of the teeth, more frequent change of clothing, shorter hours, more and better food, all these have contributed to the rising standard of health. Town-planning is another new factor which is likely to make a tremendous difference to the lives of the industrial population of the next generation and perhaps still more of the next generation but one. The community to-day has a new collective conscience and a new collective imagination, employers are alive to their responsibilities to their workers as they were not before the war; the workers themselves are better fed, more intelligent, and they are claiming and getting a larger share in shaping the conditions under which they work. Regulations, research, experiment, propaganda, these are only the means to a desired end; and they are only likely to be efficacious in so far as the end is clearly conceived and really desired by a large number of persons, and especially by those chiefly concerned, the organisers of industry and the workers themselves. And where the ends are desired the means will be found. The most encouraging sign of our time is not the technical advance, though that is of high importance, but the new conception of industrial life as a thing which might be, and should be, healthy and educative and a good thing in itself.

THE IRISH MEDICAL COMMITTEE.

(FROM OUR DUBLIN CORRESPONDENT.)

FOR some years past the organisation of the Irish medical profession has been very defective, and medical men have seemed to be without interest in any medico-political matter. It looks, however, as if this period of inertia were nearing an end, if one may judge from proceedings of the Irish Medical Committee which sat on Feb. 13th.

The meeting had been summoned to consider the proposal of the Insurance Commission to reduce the payment for certification under the National Health Insurance Acts, and the intention of the Government to appoint a Committee of Inquiry into the public medical services of the Free State. As will be seen from the appended resolutions, the Irish Medical Committee only agreed to accept the revised rate of payment for certification for a limited period. It has also asked the Government that, in accordance with the precedent of the appointment of the Irish Public Health Council in 1919, the Irish Medical Committee should nominate some of the persons to act on the Committee of Inquiry. The Irish Medical Committee also considered the necessity for a thorough organisation of the medical profession throughout the Free State. Arrangements are to be made for the signing of pledges of all medical practitioners to bind themselves to act together in any emergency that may arise to threaten their interests.

The following is the series of resolutions adopted by the meeting:—

1. That the Irish Medical Committee, on behalf of the Irish medical profession, strongly protests against the reduction of the remuneration for medical certification under the Insurance Act; that the Committee only agrees to accept the terms now offered by the Irish Insurance Commission until August 31st next.

2. That pending the result of the proposed Committee of Inquiry, outlined in the letter of the Chairman of the Irish Insurance Commission, the profession be organised thoroughly in each county in Ireland; that a medical organiser be appointed forthwith and, to meet the expenses of his appointment, &c., a levy of £2 be made upon each member of the profession in Ireland—the levy to be voluntary in the case of those members of the profession who are already subscribers *to both medical organisations in Ireland.*

3. That in the event of the report of the Committee of Inquiry being either unsatisfactory or the Dail refusing to enact medical legislation providing efficient medical services for the people and on terms acceptable to the profession, the Committee recommends that a delegates' meeting be summoned to consider the advisability of withdrawing from the public medical services.

4. That the details of organisation such as the signing of pledges, arrangement for making the levy, &c., be left in the hands of the Executive Committee appointed by the Irish Medical Committee at its meetings held on June 20th, 1923, and Feb. 13th, 1924.

5. That the scales of salaries adopted by the profession in Great Britain for whole-time medical officers, tuberculosis officers, medical school inspectors, &c., be applicable to Ireland.

6. Arising out of Sir Joseph Glynn's letter of Dec. 27th, 1923, the Minister of Finance be requested to invite the Irish Medical Committee, in accordance with custom, to nominate representatives of the medical profession in the Free State to act on the proposed Committee of Inquiry.

7. That the Irish Medical Committee is of opinion that in the best interests of the medical profession the medical schools and clinical hospitals should arrange for a short course of professional ethics for their senior students.

Finally, the Executive Committee was instructed to arrange for a deputation to wait on the Minister of Finance with regard to the taxation of motor-cars used by medical practitioners.

Correspondence.

"Audi alteram partem."

IN HONOUR OF DR. BRACKENBURY.

To the Editor of THE LANCET.

SIR,—There has been a very widely expressed desire that the eminent services of Dr. H. B. Brackenbury to the medical profession should be recognised, having regard particularly to his recent most useful and brilliant work in preparing and presenting the case of the insurance practitioner before the Court of Inquiry. Steps are already being taken to approach insurance practitioners through their panel committees, as it is thought that insurance practitioners as such would desire to have a special opportunity of expressing their gratitude. But our correspondence and conversations with many colleagues show that numerous doctors having no connexion with insurance practice would be glad of an opportunity of showing their belief that Dr. Brackenbury's services for many years past have been of great value to the profession as a whole. They consider that Dr. Brackenbury's recent advocacy and conduct of the case of the insurance practitioner have been such as to enhance very considerably the reputation, influence, and prestige of the medical profession. A large and influential committee is now being formed, and an opportunity will shortly be given to those who wish to join in a well-earned tribute to one who has rendered unique services to his profession.

We are, Sir, yours faithfully,

J. F. ALLAN (Bradford).
T. RIDLEY BAILEY (Bilston).
H. S. BEADLES (Romford).
A. CLARKE BEGG (Swansea).
R. A. BOLAM (Newcastle-on-Tyne).
J. W. BONE (Luton).
H. C. BRISTOWE (Wrington).
H. J. CARDALE (London).
L. J. CARROLL (Bradford).
H. GUY DAIN (Birmingham).
J. SINGLETON DARLING (Lurgan, Co. Armagh).
HOWARD DAVIES (Pontypridd).
C. E. DOUGLAS (Cupar, Fife).
J. D'EWART (Manchester).
W. MCADAM ECCLES (London).
C. E. S. FLEMMING (Bradford-on-Avon).
A. W. FORBES (Sheffield).
E. R. FOTHERGILL (Hove).
G. G. GENGE (Croydon).
T. D. GREENLEES (St. Leonards).
R. HARDING (Kington).
N. BISHOP HARMAN (London).
J. J. HEALY (Llanelly).
R. WALLACE HENRY (Leicester).
E. K. LE FLEMING (Wimborne).
G. AINSLIE JOHNSTON (Ambleside).
ARTHUR T. JONES (Mountain Ash).
B. M. LEWIS (Pontypridd).
E. LEWYS-LLOYD (Towyn).
T. WOOD LOCKET (Westbury).
RICHARD LUCE (Derby).
ARNOLD LYNDON (Hindhead).
PETER MACDONALD (York).
J. MCGREGOR-ROBERTSON (Glasgow).
S. MORTON MACKENZIE (Dorking).
A. MANKNELL (Bradford).
E. W. G. MASTERMAN (Camberwell).
H. MILBANK-SMITH (Worthing).
D. NAUNTON MORGAN (Gilfach Goch).
S. GLANVILLE MORRIS (Mardy).
H. F. OLDHAM (Morecambe).
E. G. D. PINEO (Langford, near Bristol).
F. RADCLIFFE (Oldham).
J. W. F. RAIT (Radlett).
J. MORGAN REES (Pontypridd).
HERBERT SHACKLETON (Bradford).
D. A. SHEAHAN (Portsmouth).
W. MUIR SMITH (Eastbourne).
A. TENNYSON SMITH (Orpington).
H. S. SOUTTAR (London).
E. A. STARLING (Tunbridge Wells).
W. E. THOMAS (Ystrad Rhondda).
A. E. TUNSTALL (Bradford).
W. N. WEST WATSON (Bradford).
E. ROYSTON WOODROOFE (Bradford).

Communications from those who desire to join the committee or have any suggestions to offer as to the nature of the testimonial may be directed to any of the above, c/o the Medical Secretary, British Medical Association, 429, Strand, London, W.C. 2.

Feb. 18th, 1924.

THE POSITION OF PSYCHO-ANALYSTS.

To the Editor of THE LANCET.

SIR,—Some aspects of the recent development of clinical psychology seem to call for serious attention. There are medical men of repute and academic standing who practise psycho-analysis or, without practising it, regard it as containing a valuable contribution to medical knowledge. Others have adopted it as a specialty without that arduous apprenticeship which should precede specialism, and there is an uncertain number of lay analysts who make no pretence to medical knowledge. We see the daily press giving prominence to denunciations of psycho-analysis by members of our own profession, and that this takes place without protest or disclaimer indicates a sentiment which regards our psycho-analytical colleagues as without the law. Though within the narrower circle of professional discussion we no longer hear demands that psycho-analysis should be suppressed, and the tone of its opponents is more moderate than it was a few years ago, yet feeling is still so strong that some degree of courage would be required for an aspirant to professional advancement to announce his belief in the doctrine. This state of affairs has precedents in the history of medicine, and it is possible that medical history is in the making without our recognising the process.

When it is considered that the theory is now nearly thirty years old, that it has met with opposition as forcible as any in the history of scientific controversy, and that its supporters are nevertheless becoming more numerous both within and without our profession, it is plain that we are dealing with no ephemeral cult but with something possessed of strong powers of survival. It is to be noted, too, that its most conspicuous opponents are men of ripe or even advanced years, and though for a new theory to be strenuously opposed is no hall-mark of soundness, yet in other respects than this the parallel still holds good, and the comparison of Freud with Harvey and Darwin, seriously advanced by his admirers and derided by his opponents, may ultimately stand confirmed. It has been hitherto assumed that all mental processes are conscious; in fact, this assumption is given axiomatic validity and used as an a priori argument to dismiss the whole theory of the unconscious, and the discovery of its invalidity will make Freud's main theory, if ultimately incorporated with our scientific principles, a landmark in the advance of knowledge, and for the very reason that it overturns the universal assumption.

But its clinical applications are our more immediate concern, and it must not be overlooked that the theory has been postulated, not for its own sake, but as a means of resuming, in convenient form, observations which many responsible medical men claim to have confirmed. Psycho-analysis is claimed to provide a psycho-pathology of mental disorders, particularly of those psycho-neurotic troubles that have been a reproach to medicine and the hunting ground of miracle-workers and charlatans. In the heat of controversy it is not likely that its cures can be properly adjudged, but, in spite of alarmist accounts, it probably has fewer failures to its discredit, in the shape of suicide or insanity, than has the rest-cure for neurasthenia. One can hardly understand why psycho-analysis, if its good results are non-existent and its methods are based upon delusion, should not be allowed to die a natural death without undue fuss or attention. If, however, it stands the test of time it should greatly enrich clinical medicine and benefit a group of sufferers for whom orthodox therapy offers but little. Meanwhile we must avoid an attitude which may intimidate honest workers, especially younger men who may fear that their careers would be prejudiced

if they attempted, by clinical investigation, to establish or confute the important principles involved in this controversy. And we must take care lest we afford another target for the gibe that mankind learns nothing from history.—I am, Sir, yours faithfully,

Feb. 13th, 1924, A TEACHER.

ELECTRONIC REACTIONS OF ABRAMS.

To the Editor of THE LANCET.

SIR,—In adding my contribution to the discussion on E.R.A. I would first state my position. I was asked to proceed to San Francisco to investigate the question by a layman, who felt that it would be an act of philanthropy if Abrams's claims were well founded, to put at the disposal of the medical profession for use among the poor and for research the armamentarium required. It was not surprising to me that many medical friends deprecated the prospective waste of time, and one of my most respected quondam teachers—and subsequent colleague—implored me not to bring discredit on the Cambridge School by running off the rails. My reply was that only by an unbiased attempt to sift the wheat from the chaff could one justify oneself scientifically. But even yet I asked myself whether I possessed the necessary knowledge of higher physics to make satisfactory critical observations or the necessary capacity for critical expression of the truth. My thoughts recurred to Sir Thomas Browne (Religio Medici) :—

"Every man is not a proper champion of the truth nor fit to take up the gauntlet in the cause of verity; many, from the ignorance of these maxims, and an inconsiderate zeal unto truth, have too rashly charged the troops of error, and remain as trophies unto the enemies of truth."

Being pressed, I accepted the mission, and set myself to follow the following lines of thought :—

(1) Did something happen, palpable, tangible, audible at the moment that the "diagnosis" was being made?

(2) If so, could this something be correlated (with any kind of constancy) with any normal or abnormal quality or function of a patient which might be or have been empirically tabulated?

(3) Was there any evidence that in the treatment given the patient derived benefit not reasonably to be attributed to suggestion?

I realised the possibility of Abrams's facts being correct while his explanations were faulty. But I reckoned without my hosts (Abrams and his followers). The first difficulty I experienced reminded me of the dictum of Hobbes in the "Leviathan": "Words are wise men's counters, they do but reckon by them; but they are the money of fools." It was clear that with the best will on my part I was unable to get into touch with their *minds*. To my questions the answers appeared to me to be conscious, or (more often) unconscious, camouflage. Categories were mingled in a way which satisfied me that it was a disability and not malice-aforethought which inhibited their logic. One enthusiast in reply to my comment that he was not logical, said: "Don't you realise, doctor, that this transcends logic." I could only bow.

I know that I shall be held guilty of violating the spirit of the old motto, "De Mortuis," in expressing an opinion (which is only my opinion and therefore lacks evidence) that the one worker who *consciously* made the *suggestio falsi* or the *suppressio veri* was Abrams himself. Of the other inquirers and practitioners, some were enthusiastic optimists to whom the wish was father to the thought, while some were men of scientific mind honestly trying (and hoping) to find enough evidence to support their actions. At least one of these told me with a sad heart that he was being forced to the conclusion that, though he still felt something did happen with the "box," he was totally unable to verify any correlation with any demonstrable pathological states—in other words, that he found himself unsatisfied that his diagnoses had any meaning.

Before approaching the magician's castle I was warned that I should find torpedo nets, in the shape of banter, irritability, and verbosity spread out all round him to fend off the direct question. This I found to be so. He received me courteously, but was entirely intolerant of any analysis of his ex cathedra statements. In one case, which appeared to be a typical scirrhous carcinoma of the breast about to fungate, he stated that his machine gave "no carcinoma reaction, sarcoma reaction," and, turning to me, said, "we treat these cases in the orthodox manner," and then told the patient she would be given a little "burning" treatment which would cause her no discomfort. On inquiry I was told, "Oh, we bake these!" but I was not enlightened as to the technique. I then asked if by sarcoma he meant a quickly-growing highly-cellular growth with very little intercellular stroma, to which he replied, "Oh, I use the term in a rather more general sense than that!"

I told him that, for me, a most helpful means of estimating the question of his good faith (apart from any success in diagnosis) would be the historical method of learning what led him over the enormous gap between his first recognition of his "reflexes" and the conception of the "box." He entirely avoided this line of inquiry. Asked if he regarded the phenomena as electrical, he said he did not know, and excused the use of the terms electron, "ohmage," &c., on the ground that "you must have some terms for the purpose of description." I became satisfied that he had no first-hand knowledge of electrophysics at all, which opinion was expressed (from a study of his publications) by the great physicist, Dr. Millikan, the American Nobel prizeman, in a paper before the Los Angeles Medical Society, when he said "it is not mediæval but prehistoric."

Now for a few words about the machines. While not myself qualified to dogmatise upon the possibility of the creation or modification of any physical "influences" upon the patient, one can state that the diagnostic box is in fact composed of a series of rheostats of small and variable resistance, which resistance does roughly correspond in units to the figures marked outside. In so far as an electrical current from without or a difference of potential occurring within the limits of the subject's body required that amount of resistance to get a particular result, it is at least conceivable that *something* might be measured; but in so far as statements are made as to rates of electronic vibration being "let through" it is so much verbose "flapdoodle."

As regards the oscilloclast, for treatment, I cannot affirm or deny that it has some physical influence, any more than I can affirm or deny that the laying-on of hands or extreme unction can have a physical (as opposed to a symbolical or suggestive effect), but it is quite clear that no one has yet been able to show by any method of physical measurement or demonstration that such occurs. We have, of course, all been told of cases which have been cured. I have had no opportunity of judging if they are truly reported. I shall not seek them, as I think my time will be better spent otherwise, but I should be one of the first sympathetically to investigate any case in which accuracy of information could be reasonably expected from the manner of its presentation. I am, Sir, yours faithfully,

GEO. LYDSTON CRIMP.

Bryanston-street, W., Feb. 19th, 1924.

*** At the District Court of the United States for the Jonesborough District of Arkansas a ruling has just been given in the first important trial involving the electronic reactions of Abrams. Dr. Mary Lecocq was prosecuted for alleged fraudulent use of the mails in connexion with her practice of E.R.A. Dr. Abrams, who had purposed to be present at the trial, was represented by his personal attorney, his unexpected death having occurred on the day preceding the case. After hearing testimony on both sides the Hon. Jacob Trieber pronounced the ruling of the Court as follows: "The Court is still unconvinced of the great curative

properties secured by this treatment, but there is no evidence to justify a finding that this woman did not actually and honestly believe in the success of that treatment or that she did, in undertaking to treat people, do it with the intention of defrauding them." The judge then directed the jury to return a verdict of Not guilty.—ED. L.

LEPROSY: A SELF-HEALING DISEASE.

To the Editor of THE LANCET.

SIR,—In his paper with this title in your issue of Feb. 9th Dr. Ernest Muir says that the significance of the fact that leprosy shows a tendency to spontaneous recovery in many cases does not appear to have been realised by modern writers on leprosy. In my Survey of Leprosy (*Quarterly Review*, April, 1903, No. 394, p. 407) I mentioned that "it cannot be denied that leprosy may be cured, or at least may become spontaneously arrested in its development and flicker out."—I am, Sir, yours faithfully,

GEORGE PERNET, M.D.,
Late English Editor of *Lepra*, the International Journal for Leprosy.

London, W., Feb. 14th, 1924.

ADVERTISING MARGARINE: A DISCLAIMER.

To the Editor of THE LANCET.

SIR,—Some of your readers may have noticed that a certain firm of margarine vendors have recently made use of my name in their advertisements. Such action was, I need hardly say, entirely unauthorised and unwarranted, and I took prompt steps to put a stop to it. I have since received an apology from the advertising agents who were responsible and a promise not to offend again.

I am, Sir, yours faithfully,

C. KILLICK MILLARD,
Feb. 11th, 1924. Medical Officer of Health, Leicester.

SPA TREATMENT AND HYDROGEN-ION CONCENTRATION OF THE BLOOD.

To the Editor of THE LANCET.

SIR,—My attention has been directed by the Buxton Medical Research Society to a leading article in THE LANCET of Dec. 22nd, 1923, headed Spa Treatment and Diuresis, in which it is stated: "Thus it was suggested by one speaker that some spa waters reduce the hydrogen-ion concentration of the blood, an effect which would, in the view of eminent physiologists, be rapidly fatal if it were possible of achievement." The point that you desired to emphasise was, I presume, that large variations in the pH of the blood are impossible without fatal results. With this I entirely agree, and in my remarks to the meeting I said, "for although possible variations in the pH are quite small, an increase from 7.25 to 7.35 ....." I think that no physiologist would venture to state that a variation of 0·1 is impossible. The recent observations of Cullen and Robinson[1] show variations of even greater magnitude. In a subsequent paper[2] they mention cases with recovery from acidosis in which the pH values at 38°C. were 6·98 and 7·02. The variations from the normal in these cases are three to four times greater than the one that I mentioned. A fact that is not generally appreciated is that a variation of 0·1 in the pH is considerable although it does not appear so on account of the mode of expression usually adopted. Thus pH 7·35 represents a hydrogen-ion concentration of $0{\cdot}45 \times 10-7$, and pH 7·25 one of $0{\cdot}56 \times 10-7$, a difference of nearly 25 per cent. This is really considerable although the variation in the pH appears quite small. I am, Sir, yours faithfully,

JOSEPH RACE,
Biochemist.

Devonshire Hospital, Buxton, Feb. 8th, 1924.

[1] Jour. Biol. Chem., lvii., p. 540.
[2] Ibid., p. 551.

Obituary.

BERNARD HARRY WEDD, M.D. LOND., D.P.H.

Dr. B. H. Wedd, former bacteriologist to the London School of Tropical Medicine, died on Jan. 28th, in Ceylon, at the age of 47. He was the fourth son of the late H. A. Wedd, of the Manor House, Woodmansterne, Surrey, and was educated at Harrow. In 1898 he entered Guy's Hospital, and graduated in 1903, obtaining the M.D. in 1906 and the D.P.H. in 1907. After holding various hospital appointments, he became assistant bacteriologist at Guy's; this was followed by his appointment as bacteriologist to the Royal London Ophthalmic Hospital. From 1910–13 he was assistant in the Cancer Research Laboratories of the Middlesex Hospital, and during those years he published several papers of importance on the subject of cancer. In 1914 he became bacteriologist to the London School of Tropical Medicine. He was jointly responsible with his sister, Miss A. F. Wedd, for the English translation of Duclaux's "Pasteur and His Work." At the outbreak of war he joined the R.A.M.C., and went to the front in the 23rd Field Ambulance with the famous Seventh Division, remaining in France, with one interval of a few months' sick-leave, until demobilised in the spring of 1919. His always delicate constitution never recovered from the strain of those five years, and it was during a visit to Ceylon, undertaken for the sake of his health, that he died.

Mr. Bryden Glendining writes as follows: "The many former colleagues of the late B. H. Wedd will have learnt of his recent death with sincere regret. His work in the bacteriological laboratories of several hospitals and in the Middlesex cancer laboratories was marked by an unusual depth of sincerity. His high ideal of research made him very critical of the standard of his own work, so that much was never published, because it failed to attain completeness or required more control experiments than he was able to provide. A man of retiring disposition, he formed few real friendships, but these few friends found his devotion to their service unstinted and his loyalty and kindness abiding. He brought an incisive acumen to bear upon any subject under discussion, and had an astonishingly wide range of general knowledge. His strength of character first revealed itself to me during an acute attack of rheumatic fever, with extensive cardiac complications, soon after he qualified. He struggled for weeks with uncomplaining fortitude in what seemed a hopeless battle, but to everyone's surprise he was again playing tennis, golf, and hockey, at all of which he excelled, a few months later."

JACQUES LOEB, M.D. STRASB.

Dr. J. Loeb, head of the Division of Physiology in the Rockefeller Institute for Medical Research, New York, died at Hamilton, Bermuda, on Feb. 12th, after a brief illness, in his sixty-sixth year. Born in Berlin in 1859 he received his early education there. He studied medicine at the universities of Berlin, Munich, and Strasbourg, graduating M.D. in 1884. His first appointment was as assistant in physiology at the University of Würzburg, returning at the end of two years to a similar post in Strasbourg. In 1891, after a short period of study at the Biological Station at Naples, he went to the United States as professor of biology at Bryn Mawr College. The following year he became assistant to the professor of physiology in Chicago University, whom he succeeded in the chair in 1900. Three years later he became professor of physiology in the University of California, where he remained for seven years until his appointment in 1910 as head of the Department of Experimental Biology at the Rockefeller Institute, New York. As a physiologist Prof. Loeb enjoyed an international reputation. He was the recipient of honorary degrees from Cambridge, Geneva,

Leipzig, and from his alma mater of Strasbourg, and many famous scientific societies and academies in both Europe and America conferred honorary membership upon him. Prof. Loeb was the author of a large number of important works in his own subject. His first publication was a treatise on the Heliotropism of Animals and its Identity with the Heliotropism of Plants, published in Würzburg in 1890. In 1900 he published "The Comparative Physiology of the Brain and Comparative Psychology," followed in 1905 by "Studies in General Physiology," and in the following year by "The Dynamics of Living Matter." In 1912 appeared "The Mechanistic Conception of Life," and in 1913 his brilliant work on "Artificial Parthenogenesis and Fertilisation." In this monograph he described step by step the evolution of his ideas on the subject, as the result of his initial experiments on the eggs of sea-urchins. His work, along with that of Delage in France, and others, showed indisputably that in a number of invertebrates—echinoderms, worms, molluscs, and some insects—it was possible to produce parthenogenetic development through treatment by various chemical and physical means, although the exact nature of the stimulus required could not be determined.

In 1922 he published the results of several years' work on the subject of "Proteins and the Theory of Colloidal Behaviour," in which he contended that colloids combine with acids or alkalis according to the laws of crystalloid chemistry, thus attacking the view that these bodies are governed by two entirely different sets of laws.

Prof. Loeb married in 1891 Anne, daughter of G. H. Leonard, of Easthampton, Massachusetts, and had two sons and one daughter.

CAMPBELL WILLIAM DE MORGAN, M.R.C.S., L.R.C.P. LOND.

THE death of Dr. C. W. De Morgan, on Jan. 27th, at St. Leonards, ends the male line of this distinguished family. Campbell William De Morgan was born at King Williams Town, S. Africa, in 1877, where his father, Dr. Edward Lindsey De Morgan, was in practice. He was the grandson of the mathematician and philosopher Augustus De Morgan, and was named after his uncle William De Morgan, artist, potter, and novelist, and his great uncle Campbell De Morgan, the surgeon, whose memory will be familiar to all medical men in association with "De Morgan spots." He was educated at St. Mary's Hospital, where he qualified M.R.C.S., L.R.C.P. in 1912. After holding appointments at the London Lock Hospital and the Kensington General Hospital he settled in general practice in London. In practice he acquired a host of friends, especially amongst the poor, but he was never ambitious of scientific distinction, and his happiest times were spent, undoubtedly, in the musical and literary circles of Hampstead and Chelsea, where his family connexions gave him a ready entry. During the war he suffered greatly from overwork and some 18 months ago his health broke down completely. He is survived by two sisters.

THE LATE SIR KENNEDY DALZIEL.

WE have received the following personal appreciations of the late Sir Kennedy Dalziel, whose obituary notice appeared in our columns last week.

Mr. Farquhar Macrae, visiting surgeon to the Western Infirmary, Glasgow, writes: "By the death of Sir Kennedy Dalziel, Glasgow and the whole West of Scotland has lost not only an unusually skilful surgeon, but one who occupied a much larger place in the public eye than is usually the case with the successful surgeon, for his interests were wide and were not confined to the merely professional side of life. The writer of this note knew him intimately for over 30 years, first as one of his students, then as his assistant, and latterly as a colleague; and in all these capacities found him equally engaging and equally helpful. His success and the public position he attained were the result of an unusual combination of qualities. Possessed of a fine presence and a manner of great charm and kindliness, he early laid the foundations of his professional success by assiduous study of anatomy when a student under the late Prof. Johnston Symington in Edinburgh, and of pathology during the time he spent in Berlin and Vienna before coming to Glasgow as house surgeon to Sir William Macewen at the Royal Infirmary. Though a complete stranger in Glasgow, his outstanding ability and his obvious bent towards surgery were early recognised, and he soon obtained appointments in the out-patient department of the Western Infirmary and the Children's Hospital.

"Never at any time a great reader or close student of surgical literature, he had an extraordinary capacity for acquiring information, or as he used to phrase it, 'for picking people's brains.' Even knowing this one was constantly surprised at the extent and variety of his knowledge of current surgical opinions and the shrewdness with which he was able to criticise them. As an operator Sir Kennedy Dalziel was facile princeps during the past generation in the West of Scotland. Even in his early days his manipulative dexterity was something to marvel at. Never specially original, he had a mind open to new ideas, and was one of the pioneers in Scotland in abdominal surgery. He was the first to have a recovery after operation for perforated gastric ulcer, and for peritonitis following perforation in enteric fever.

"To those who knew him intimately it was not, however, the surgeon that appealed most, but the man. Full of the milk of human kindness, always genial and enjoying the humour of life, he was a delightful companion. He made few enemies and a host of friends. Even to one who knew him well and appreciated his qualities it was remarkable to find, as one went about the West and South of Scotland during his long last illness, how great was the sense in all grades of society of a personal misfortune and loss. Except Sir Hector Cameron, who is fortunately still with us, no surgeon in the West of Scotland has filled so great a place in the estimation of the public as Sir Kennedy Dalziel, or filled it so adequately."

Prof. T. K. Monro, Regius Professor of the Practice of Medicine in the University of Glasgow, writes: "While the most important estimate of Sir Kennedy Dalziel's work must of necessity come from a surgeon, it is perhaps fitting that a tribute to his memory should be rendered by a physician who knew him well and valued his help very highly. My friendship with Dalziel dated back to 1890, and I believe that in that year I gave the anæsthetic to the first patient on whom he performed abdominal section. My feeling of admiration for his skill and neatness, and for his apparently natural aptitude for that department of practice was not lessened by the subsequent witnessing of many laparotomies performed by himself and others, and I think he was recognised by all as particularly adept in abdominal surgery. He was my colleague at the Western Infirmary from 1913 onwards, and on innumerable occasions my patients had the benefit of his advice, encouragement, and professional skill. His help was given most willingly and his manner with the patients was delightful.

"Dalziel did a good deal of court work in his day, and was well known as a clever witness. He did not publish much, but one of his noteworthy contributions to medical literature was his description in 1913 of the rare condition which he termed chronic interstitial enteritis. In ordinary life he was a most genial and interesting companion. He had an immense practice among rich and poor, and the crowd which assembled at the funeral service in the cathedral and followed his remains to the necropolis included doubtless not a few who were indebted to him for the preservation of their lives or for their restoration to health. To many besides his sorrowing relatives his departure means a great loss."

Medical News.

UNIVERSITY OF OXFORD.—The trustees of the Rockefeller Foundation have offered to the University a gift of £75,000 for the development of the department of biochemistry. A decree was carried without opposition authorising the assignment of a further area of 9 acres of the University park for the extension of the science departments.

In a Congregation held on Feb. 16th the following degrees were conferred:—*D.M.:* S. C. Dyke, Exeter. *B.M.:* B. G. Scholefield, Christ Church.

UNIVERSITY OF LONDON.—The second of the series of four lectures on cancer in the Governors' Hall, St. Thomas's Hospital, Albert Embankment, S.E. 1, by Dr. J. A. Murray, at 5 P.M., on Thursdays, will be given on Feb. 28th, subsequent lectures taking place on March 6th and 13th. The three remaining lectures of the course of four lectures on Blood will be given by Prof. B. J. Collingwood at St. Mary's Hospital Medical School, Praed-street, Paddington, W., at the same dates and time. Attendance at this course is recognised in connexion with the B.Sc. (Honours) Degree in Physiology. Admission to both courses of lectures is free.

Thomas Smythe Hughes Medical Research Fund.—The Senate will proceed shortly to consider applications for grants from this Fund, which are allocated annually for the purpose of assisting original medical research. Applications must be received not earlier than May 1st and not later than June 16th, 1924, and must be accompanied by the names and addresses of not more than two persons to whom reference may be made. Further particulars may be obtained from the Academic Registrar.

A *University Studentship in Physiology*, of the value of £50 for one year, will be awarded to a student qualified to undertake research in physiology, and will be tenable in a physiological laboratory of the University or of a school of the University. A student will not be eligible for re-election. Candidates must be matriculated students or graduates of the University, and must submit a statement of their qualifications, together with the names of three persons as references, when applying the Principal Officer on or before May 31st, 1924. Full regulations for the award of the studentship may be obtained on application.

University College Medical School.—The Senate invite applications for the Graham Scholarship in Pathology, value £300 per annum, in the first instance for two years, founded under the will of the late Dr. Charles Graham to enable "a young man to continue his pathological researches and at the same time to secure his services to the School of Advanced Medical Studies connected with University College Hospital as a teacher under the direction of the professor of pathology." The successful candidate will, if possible, take up the scholarship as from April 1st, 1924. Intending applicants who desire fuller information of the conditions on which the scholarship will be held may call personally on Prof. A. E. Boycott, University College Hospital Medical School, W.C. 1, after having made an appointment. The scholarship is in no way restricted to students either of University College Hospital Medical School or any other medical school of the University of London. Applications, addressed to the Principal Officer, University of London, South Kensington, S.W. 7, must (*a*) be accompanied by the names of not more than three references, one at least of which should be the name of some professor, lecturer, or teacher of the university or college in which the candidate has conducted his studies in pathology, (*b*) state the research upon which the applicant proposes to work, and (*c*) be received not later than the first post on Monday, March 3rd, 1924. Envelopes should be marked "Graham Scholarship."

The Council of King's College have granted the title of Emeritus Professor to Dr. R. H. Steen on his retirement from the Professorship of Psychological Medicine at King's College Hospital.

NATIONAL COUNCIL FOR COMBATING VENEREAL DISEASE.—An Imperial Social Hygiene Congress, organised by this Council, is to be held at the British Empire Exhibition from May 12th to 16th. The Congress will be opened by the Minister of Health, and a review of the existing situation will be given by the Chief Medical Officer of the Ministry of Health and a medical member of the Scottish Board of Health. The Dominions Overseas and the Crown Colonies have been invited to send representatives. Dame Rachael Crowdy will, it is hoped, open the discussion on the International Aspect of Social Hygiene, and will be followed by Sir Arthur Newsholme and others. On May 13th, under the Presidency of Viscount Astor, Prof. J. A. Thomson and Sir Frederick Mott will define the problem of training the young in sex control, stating the biological and sociological reasons for maintaining a monogamous system of marriage and a stable family. In the afternoon of the same day Mr. James Stewart, the Under Secretary of Health for Scotland, will preside over the Conference, which will discuss the Place of the Local Authority in the Venereal Diseases Campaign, Mr. W. E. Whyte acting as hon. secretary of the section. On May 14th Dr. Kay Menzies will preside over a Conference of special interest to venereal disease officers of clinics, to hospital almoners, and to all concerned in the problem of securing the maximum efficiency of the venereal disease clinic. This Conference will be preceded in the morning by a display of the propaganda films. Colonel L. W. Harrison will open the discussion from the point of view of the clinical officer; Dr. J. J. Butterworth, county medical officer of health for Lancashire, will deal with the administrative aspect; Dr. Margaret Rorke will be in a position to give the experiences of the women's clinics, and it is hoped that these British speakers will be supplemented by representatives from overseas. The position of the general practitioner in the anti-venereal disease schemes will be considered on May 15th, when a display of technical medical films will also be given. Mr. E. B. Turner will preside over this section. Mr. Amery, late Parliamentary Secretary to the Colonial Office, will preside over the special section devoted to the consideration of Imperial questions. The names of the speakers in this section are not yet to hand, but the Governments and the medical departments of the Dominions and Crown Colonies have all been invited to nominate representatives, and it is hoped that those parts of the Empire where an active programme is in operation will give the workers in the home country the benefit of their experiences. The discussion in the morning of May 16th will be on the Social Hygiene Movement Overseas, and in the afternoon on Methods of Enlightenment for Illiterate Races. Owing to the uncertainty of the political situation, it has not been possible to ascertain whether this Congress can be included as part of the official programme of the work of the Council for the coming year. If it was to be held it was necessary, therefore, for the Council to undertake the arrangements in their capacity as a voluntary organisation. The subjects under discussion are of such outstanding importance that the opportunity should be taken, it is felt, for an interchange of ideas on Imperial lines.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At an ordinary Council meeting held on Feb. 14th, Sir John Bland-Sutton being in the chair, a report was read from the Court of Examiners respecting candidates found qualified for the diploma of Member, and diplomas were granted to 197 candidates.—A report was read from the Conjoint Examining Board respecting candidates found qualified for the diploma in Ophthalmic Medicine and Surgery, and diplomas were granted jointly with the Royal College of Physicians to 12 candidates mentioned in the report.—It was agreed that the President, Sir John Bland-Sutton, be authorised to act with the President of the Royal College of Physicians as almoner for the fund offered by Lord Atholstan for the cure of tuberculosis, to use the fund at their discretion in assisting research work, or, if necessary, in initiating new lines of work in tuberculosis.—The President reported that a meeting of the Fellows would be held at the College on Thursday, July 3rd, for the election of three Fellows in the vacancies occasioned by the retirement from the Council in rotation of Mr. William F. Haslam, Mr. T. H. Openshaw, and Mr. Raymond Johnson; that notice of the meeting would be given to the Fellows by advertisement and by circular on March 7th, that March 17th would be the last day for the nomination of candidates, and that a voting paper would be sent on April 1st to every Fellow of the College whose address is registered at the College.—The President further reported that the Fellows would be invited to attend a reception to be held from 4–6 P.M. on the same day, and that the annual exhibition of additions to the museum would be open for inspection during that time.

SIR JOHN TWEEDY'S COLLECTION.—A collection of instruments used by the late Sir John Tweedy has been presented by his widow to the museum of the College of Surgeons. The most important are two patterns of optometers, used by Tweedy for estimating the degree of astigmatism and other errors of refraction, and first described in THE LANCET of Oct. 28th, 1876,[1] are interesting additions to the group of instruments actually used by their own designers. These include a Beer's knife presented by Prof. Beer himself to G. J. Guthrie, a set of strabismus instruments used by Guthrie in his practice, a Jaeger's strabismus hook given by Jaeger to White Cooper, and a Tyrell's cataract knife used by its inventor.

[1] See also THE LANCET, April 24th, 1886.

UNIVERSITY OF WALES.—At a recent examination for the Tuberculous Diseases Diploma the following candidate was approved: Johan Fredrik Wicht.

THE Minister of Agriculture has announced his intention to appoint a committee of veterinarian and human pathologists to frame a scheme for investigating the causes of foot-and-mouth disease and the possibility of creating immunity for cattle.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH.—The Morison lectures will be delivered by Dr. John Thomson within the Hall of the College, 9, Queen-street, Edinburgh, on Monday, Wednesday, and Friday, March 3rd, 5th, and 7th, at 5 P.M. The subject of the lectures will be the Symptoms, Diagnosis, and Treatment of Mental Defect during Infancy and Early Childhood.

A DINNER of the Royal College of Physicians of Edinburgh was held in the hall of the College, 9, Queen-street, on Feb. 15th.

MANCHESTER CLINICAL SOCIETY.—On Thursday, Feb. 28th, at 4.30 P.M., Sir Thomas Horder will lecture on Medicine and Old Ethics in the Medical Society's Library.

INTERNATIONAL SOCIETY OF MEDICAL HYDROLOGY.—A special meeting of the society will be held at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., on March 5th, at 4.30 P.M., when a discussion on the Treatment of Tropical Disease by Waters and Baths will be opened by Dr. Pierret, of La Bourboule, France. All interested are invited to attend.

ANTI-TUBERCULOSIS CAMPAIGN IN CANADA.—It is announced that Lord Atholstan has offered to coöperate with the Government in a campaign against tuberculosis, and proposes to contribute £100,000 towards the cost. His suggestion is that in the first place measures should be taken in other districts on the lines of the Framingham experiment.

UNIVERSITY OF PARIS.—A special practical revision course has been instituted by the Faculty of Medicine at the Medical Clinic of the Hôtel-Dieu on modern methods in clinical work and the application of a current laboratory technique in diagnosis. The course of 35 lectures and demonstrations, which will be conducted in French, commences on Monday, April 7th, and continues till April 18th, under the direction of Prof. Maurice Villaret, assisted by many collaborators. The fee is 150 francs, and the course is open to French and foreign medical men. A full programme may be obtained from the Secretary of the Faculty of Medicine at the University.

THE PRICE OF INSULIN.—The Medical Research Council announce that the principal firms engaged in the manufacture of insulin in this country have arranged to reduce the retail price from 12*s.* 6*d.* to 6*s.* 8*d.* per bottle of 100 units, the change to take effect on Feb. 25th. It will be remembered that the original price in April, 1923, was 25*s.*, and that this was reduced to 17*s.* 6*d.* in July. A gradual increase of 40 per cent. in the strength of the unit then followed, and on Jan. 1st, 1924, the price of 100 revised units was fixed at 12*s.* 6*d.* After less than a year's experience of large scale production the manufacturers have thus found it possible to reduce the original price by nearly three-fourths nominally, and by four-fifths relatively to the actual strength of the product. The new price is below the most recent retail price in America of which information has been received. The Council's announcement concludes: "It may be added that the recently described method of extracting insulin without the use of alcohol has not yet reached the stage of commercial application. In view of the difference between laboratory and large scale methods and of the efficiency to which the alcohol process has now been brought commercially, it must remain uncertain for some time to come whether or not further reductions in price are to be expected from any change of method in this direction."

We are informed by Messrs. Burroughs, Wellcome and Co., who produce the "Wellcome" brand insulin, that their scientific and technical workers have been successful both in improving the yield of insulin from the raw material and in raising the standard of purity. There have been no dramatic discoveries but a series of technical improvements, each step contributing its share to economy in preparation and purity of the product.

Messrs. The British Drug Houses, Ltd., writing on behalf of Messrs. Allen and Hanburys Ltd. and themselves, announce that progressive large-scale manufacture has enabled their hopes of lower cost of production to be realised, and the benefit is to be handed on to the public, this being the third reduction in the price of insulin "A.B." brand since manufacture was begun just over a year ago.

THE Swiney Prize for 1924 has been awarded by the Royal College of Physicians and the Royal Society of Arts to Sir Paul Vinogradoff, F.B.A., Corpus Professor of Jurisprudence in the University of Oxford, for his work, "Outlines of Historical Jurisprudence." The prize consists of a cup, the value of which is £100, and a cheque for £100. It is awarded every fifth year to the author of the best work on jurisprudence.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The Royal Northern Hospital has arranged in conjunction with the Central London Ophthalmic Hospital, the North-Eastern Fever Hospital, and the Royal Chest Hospital, for a two weeks' intensive course from March 3rd to March 15th. It will include demonstrations of clinical methods and cases, lecture-demonstrations, and work in all departments of the hospital from 10.30 A.M. each day. Further particulars, with copies of the complete syllabus, can be obtained on application to the Secretary to the Fellowship of Medicine. A further special course in gynæcology will be given by members of the staff at the Chelsea Hospital for Women from March 3rd to March 28th. The course will consist of lectures and clinical demonstrations in the wards and out-patient department, and in most instances the lectures will be preceded by demonstrations of cases in the out-patient department or by operations in the theatre. A series of lectures and demonstrations in psychological medicine will be given by Dr. J. G. Porter Phillips and Dr. Thomas Beaton at Bethlem Royal Hospital, on Thursdays and Saturdays, at 11 A.M. The subjects of the lectures are given in the syllabus, which is now available. A series of six lecture-demonstrations dealing with recent advances in medical electrical treatment will be given by Dr. C. B. Heald, at the Royal Free Hospital, on Wednesdays, at 5.30 P.M., from March 5th to April 9th. A course on diseases of children, arranged by the Royal Waterloo Hospital for Children and Women, will be held from March 17th to April 5th. The various aspects of children's diseases will be dealt with by members of the staff by means of lecture-demonstrations, ward work, out-patient cliniques, operations, &c. At the end of March a course in ophthalmology will be given at the Royal Westminster Ophthalmic Hospital, details of which will be announced later. Copies of the syllabus with full particulars regarding any of the foregoing courses can be obtained on application to the Secretary of the Fellowship of Medicine, 1, Wimpole-street, London, W. 1.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lt. (short service) A. C. Esmonde is transferred to the Permanent List.

Surg. Lt. G. L. Stanley is allowed to withdraw with a gratuity.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Majs. retire on ret. pay: A. E. B. Wood (granted the rank of Lt.-Col.), H. T. Stack, D. P. Johnstone (secd. Staff, India).

The undermentioned Capts. to be Majs.: A. G. Biggam, R. K. Mallam, D. T. M. Large, W. W. Pratt, A. Hood (Temp. Maj.), E. A. Strachan, C. J. Blaikie, J. H. M. Frobisher, W. B. Stevenson, D. T. Richardson, C. M. Ingoldby, G. A. Blake, (Bt. Maj.), C. J. H. Little, S. J. Barry (Prov.), R. W. Vint, H. W. L. Allott (Prov.), E. P. Allman-Smith.

Capt. G. E. MacAlevey is secd. for service with the Egyptian Army.

Temp. Capt. D. S. Taylor relinquishes his commn. (granted the rank of Maj.).

TERRITORIAL ARMY.

Lt.-Col. G. W. Miller, from R.A.M.C.T.A., to be Col. and Asst. Director of Medical Services, 51st (High.) Divn. T.A., vice Col. F. Kelly, vacated.

Capt. J. D'A. Champney, R.A.M.C., to be Divl. Adjt., 53rd (Welsh) Div., vice Maj. M. White, R.A.M.C., vacated.

ROYAL AIR FORCE.

J. J. Clarke is granted a short service commission as a Flight Lt.

Flight Lt. B. F. Beatson is promoted to rank of Squadron Leader on completion of ten years' service.

INDIAN MEDICAL SERVICE.

Lt.-Col. A. N. Fleming to be Col.

Dwarka Prasad Bhargava to be Temp. Capt.; Muneeh-ud Din Ninhas, Asa Nand Narang, and Lachhman Das Khatri to be Temp. Lt.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 13TH.

Insurance Act Medical Service.

Sir KINGSLEY WOOD asked the Prime Minister whether he proposed to advise the setting up of a Royal Commission to investigate the medical service under the National Insurance Act and kindred matters.—Mr. RAMSAY MACDONALD replied: Perhaps the hon. Member will be good enough to repeat his question this day week, when I hope to be in a position to reply to it.

Remuneration of Panel Practitioners.

Sir KINGSLEY WOOD asked the Minister of Health whether he had received the report of the committee of inquiry appointed to consider the remuneration to be paid to national health insurance practitioners; and what steps he proposed to take in the matter.—Mr. WHEATLEY replied: The recommendations of the Court of Inquiry have already been published, but I am not at this stage prepared to anticipate the provisions of any legislation required to give effect to these recommendations.

THURSDAY, FEB. 14TH.

The Lease of Bellahouston Hospital.

Mr. MURRAY asked the Minister of Pensions if the Ministry intended to close Bellahouston military hospital, Glasgow; and, if so, what arrangements were being made to provide treatment for ex-Service men at present accommodated at Bellahouston or who attended there for treatment and advice.—Mr. F. O. ROBERTS replied: I have no intention of closing Bellahouston Hospital if it can be avoided, and I am hoping that it may be found practicable to come to an arrangement with the Glasgow Corporation, who own the land upon which the hospital stands, with a view to an extension of the expiring lease.

Treatment Allowances.

Mr. KEDWARD asked the Minister of Pensions the number of ex-Service pensioners who attended hospital during January this year as out-patients and received treatment allowances, and the number of such out-patients in receipt of treatment allowances during the same month of the years 1921, 1922, and 1923; if he was aware that very grave hardship was inflicted on large numbers of ex-Service pensioners who had been under treatment in Ministry of Pensions hospitals owing to the termination of treatment allowances immediately on their discharge from hospital; whether he would arrange for treatment allowances to be paid to those men for at least one week after discharge; and was he aware that an organisation upheld by voluntary contributions—namely, the British Red Cross—very often had to help in such cases to prevent privation and suffering to such men and their families.—Mr. F. O. ROBERTS replied: I regret that figures for the precise periods mentioned are not available, but I am circulating information which will, I think, serve the hon. Member's purpose. The point raised in the latter part of the question has recently been inquired into by a departmental committee, who have recommended that my department and the Ministry of Health should jointly consider what steps can properly be taken in the circumstances mentioned. The whole matter is receiving my consideration. The following are the particulars referred to:

—	No. undergoing out-patient treatment.		Total.
	With allowances.	Without allowances.	
During Dec., 1923 ..	10,259	26,956	37,215
During Dec., 1922 ..	19,833	51,042	70,875
During May, 1922* ..	27,701	60,733	88,434

* The earliest date for which records are available.

Beckett's Park Hospital, Leeds.

Sir GERVASE BECKETT asked the Minister of Pensions whether a decision had been arrived at as to the closing of the military hospital at Beckett's Park, Leeds; whether he was aware of the hardship and inconvenience to the many hundreds of ex-Service patients attached to the hospital; whether he had considered the great expense entailed upon removal elsewhere and the loss of the large sums laid out upon the present buildings; and whether he was aware that the proposal had excited great apprehension in the minds of the patients and indignation amongst their relatives and the people of Yorkshire generally.—Mr. F. O. ROBERTS replied: This building is held by the Ministry on a lease which will expire next August. I am anxious to obtain a renewal, and negotiations to that end are proceeding.

Ex-Service Men and Tuberculosis.

Mr. SHORT asked the Minister of Pensions the number of ex-Service men suffering from tuberculosis who had been deprived of their pensions for one reason or another.—Mr. F. O. ROBERTS replied: Since July, 1922, the earliest date available, 900 awards in respect of pulmonary tuberculosis have been discontinued out of a total of 38,000 awards in payment for that disability.

Mr. SHORT asked the Minister of Pensions whether he was aware of the large number of ex-Service men suffering from pulmonary tuberculosis who had been deprived of their pensions on the ground that the disability had ceased but whose health and physical condition did not permit them to follow any but exceptional occupations which were most difficult to obtain, who could not withstand varying weather conditions; and, if so, what action, if any, did he propose to take to assist such cases.—Mr. F. O. ROBERTS replied: I am aware of this difficulty, which will have the earliest possible consideration. I shall, of course, be glad to look into any particular case which my hon. friend may have in mind.

The Feeding of School-children.

Mr. MARLEY asked the President of the Board of Education whether it was his intention to continue the system known as rationing, by which the sum available to be divided among all the local education authorities who were prepared to undertake to provide meals for school-children was strictly limited, with the consequence that thousands of children had to go to school insufficiently fed.—Mr. C. TREVELYAN replied: I do not propose to retain a specific limit on the expenditure of local education authorities on the provision of meals for school-children for the calculation of grant. At the same time, I rely on local education authorities to exercise due economy and care in the administration of this service.

The White Lead Convention.

Mr. GRAHAM WHITE asked the Minister of Labour if the difficulties which prevented the ratification of the convention on the use of white lead in paint had yet been removed; and if it was now the intention of the Government to agree to the ratification of this convention.—Mr. T. SHAW replied: I have been in consultation with my right hon. friend, the Home Secretary. The question is under consideration by His Majesty's Government, and the decision will be announced as soon as possible.

Use of Tuberculin by Farmers.

Mr. SPERO asked the Minister of Health whether he was aware that a number of farmers injected their herds with tuberculin and that such injections had the effect of nullifying the veterinary inspectors' tests; and whether he would restrict the sale of tuberculin to qualified medical men and veterinary surgeons.—Mr. BUXTON replied: I am aware that a tuberculous animal which has been subjected to the tuberculin test will not normally react again to this test for a considerable time, and that an unscrupulous stock-owner therefore might use this to enable him to pass a tuberculous animal for a healthy one. I have no reason to think, however, that this practice is carried on to any appreciable extent. Many farmers use tuberculin for the legitimate purpose of testing their herds, and I am not prepared at present to place obstacles in their way by adopting the suggestion contained in the second part of the question.

Infant Welfare Centres.

Mr. BLACK asked the Minister of Health whether he was willing to sanction the establishment of infant welfare centres under the supervision of the county councils, and with the usual Government grants wherever efficient voluntary services were offered for the proper conduct thereof.—Mr. WHEATLEY replied: I am prepared to consider where additional centres are needed for proposals for the establishment of infant welfare centres by local authorities, or by voluntary bodies acting in coöperation with local authorities, and to pay the usual grants-in-aid on approved expenditure.

Hospital Treatment for Tuberculosis.

Mr. BLACK asked the Minister of Health whether he was prepared to sanction the provision of hospital treatment for advanced cases of tuberculosis as proposed by the county of Leicester; and, if not, whether he had considered the futility of providing treatment for many early cases of consumption whose disease could be directly traced to infection from persons in an advanced state of tuberculosis who were compelled to remain in crowded houses until removed by death.—Mr. WHEATLEY replied: The question of the provision of hospital treatment for advanced cases of tuberculosis in Leicestershire is receiving my consideration in connexion with communications which have taken place between my department and the county council as to the

most suitable means of effecting such provision. The second part of the question does not, therefore, arise.

FRIDAY, FEB. 15TH.

Tuberculosis in Cattle.

Sir ROBERT ASKE asked the Minister of Health whether his attention had been called to the report of the veterinary inspector of Newcastle-upon-Tyne, upon his examination of cattle sent in for slaughter for food, showing that of cattle externally sound over 74 per cent. were in fact suffering from tuberculosis, and to the representations of the city council with reference thereto; and whether the Government would introduce at an early date legislation for protecting infant life against the risks arising from the distribution of milk infected with tubercle bacilli.—Mr. WHEATLEY replied: Yes, sir. My attention has been drawn to the report of the Newcastle-upon-Tyne veterinary inspector, and to the representations of the city council with reference thereto. With regard to the second part of the question, I would refer the hon. Member to the Milk and Dairies (Consolidation) Act, 1915, the operation of which is postponed till Sept. 1st, 1925, by the Milk and Dairies (Amendment) Act, 1922.

MONDAY, FEB. 18TH.

The "Humane Killer."

Sir HARRY BRITTAIN asked the Minister of Agriculture whether he would do what he could to expedite the compulsory introduction of the humane killer into this country.—Mr. WHEATLEY, who replied, said: The matter will receive the consideration of the Government. As the hon. Member was informed in July last, any local authority can make the use of the "humane killer" compulsory in its own area, and over 100, including the L.C.C., have already done so.

Deaths from Infectious Diseases.

Mr. BROAD asked the Minister of Health how many deaths were registered in 1923 as due to small-pox, measles, influenza, pneumonia, diphtheria, and scarlet fever.—Mr. WHEATLEY replied: The following are the provisional figures of the deaths registered in 1923 as due to these diseases (except pneumonia): small-pox, 7; measles, 5200; influenza, 8371; diphtheria, 2674; scarlet fever, 971. The final figures, including the number of deaths from pneumonia, will not be available until the end of the present quarter.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Feb. 25th.

ODONTOLOGY: at 8 P.M.
Casual Communication:
Mr. W. W. James: Hæmorrhage following Tooth Extraction.
Adjourned Discussion on Pyorrhœa, to be reopened by Mr. J. G. Turner.

Tuesday, Feb. 26th.

MEDICINE, NEUROLOGY, OPHTHALMOLOGY, OTOLOGY } at 5.30 P.M.
Joint Discussion on Vertigo.
Dr. R. Hutchison (President of the Section of Medicine) in the chair.
Speakers: Sir Humphry Rolleston, Dr. Gordon Holmes, Mr. Sydney Scott, and Mr. J. Herbert Fisher.

Wednesday, Feb. 27th.

COMPARATIVE MEDICINE: at 5 P.M.
Paper:
Dr. T. W. M. Cameron: The Pig and Human Diseases.
Specimens:
Dr. R. T. Leiper and Dr. T. W. M. Cameron will show a series of specimens illustrating Host Reactions to Helminth Infections.

Thursday, Feb. 28th.

UROLOGY: at 8.30 P.M.
Papers:
Dr. W. MacAdam: Cholesterol Content of Blood in Relation to Genito-urinary Sepsis.
Mr. H. Winsbury White: Subparietal Injury of the Kidney.

Friday, Feb. 29th.

The next Social Evening will be held on Friday, Feb. 29th, when Fellows, Members of Sections, Associates, and their friends will be received by the President, Sir William Hale-White, and Lady Hale-White, at 8.30 P.M.
Dr. Arnold Chaplin will give, at 9 P.M., a brief discourse on Famous Medical Men of the Eighteenth Century, with lantern illustrations of portraits.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, Feb. 25th.—8.30 P.M., Discussion on the Treatment of Fibroids of the Uterus. To be introduced by Dr. Cuthbert Lockyer, followed by Sir George Blacker, Mr. Thos. G. Stevens, Dr. H. Williamson, Mr. Beckwith Whitehouse, Dr. N. S. Finzi, Mr. J. P. Hedley, Dr. Douglas Webster, and others.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.
FRIDAY, Feb. 29th.—8.30 P.M., Discussion on the Instruction of the Medical Profession and the Lay Public with respect to the Facilities provided for the Diagnosis and Treatment of Venereal Disease. The following will take part: Colonel L. W. Harrison, Dr. F. Kay Menzies, Mr. Frank Kidd, Mr. E. B. Turner, Prof. Winifred Cullis, Mrs. Neville Rolfe.

ROYAL SOCIETY OF ARTS, John-street, Adelphi.
WEDNESDAY, Feb. 27th.—8 P.M., Dr. Charles F. Myers: The Use of Psychological Tests in the Selection of a Vocation.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 25th, to FRIDAY, Feb. 29th.—Combined Course on Diseases of Children. Clinical Demonstrations and Lectures from 10 A.M. to 4.30 P.M. daily, including the CHILDREN'S CLINIC (WESTERN GENERAL DISPENSARY), the PADDINGTON GREEN CHILDREN'S HOSPITAL, the VICTORIA HOSPITAL FOR CHILDREN, and the ROYAL WATERLOO HOSPITAL.—LONDON LOCK HOSPITAL. Clinical work daily. Lectures at Dean-street as follows: Mon., 5 P.M., Mr. Gibbs: Ante-natal and Post-natal Treatment of Syphilis; Tues., 2.30 P.M., Mr. McDonagh: Microscopic Demonstrations of Leucocytozoon Syphilidis; Thurs., 4.30 P.M., Mr. Abel: Treatment of Chronic Gonorrhœa in the Male.—LONDON SCHOOL OF TROPICAL MEDICINE. Tues. and Thurs., 2 P.M., Special Clinical Demonstrations.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEBRUARY–MARCH, 1924.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, Feb. 25th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Spinal Cord Diseases: Dr. James Taylor.
TUESDAY, Feb. 26th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Demonstration of Specimens of Cerebral and Spinal Tumours: Dr. Greenfield.
THURSDAY, Feb. 28th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Intracranial Complications of Middle-ear Disease: Mr. Just.
FRIDAY, Feb. 29th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Surgery of Spinal Cord: Mr. Sargent.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, Feb. 25th.—12 noon, Poliomyelitis and Lethargic Encephalitis: Dr. J. G. Greenfield.
The fee for the Course, including Pathology, is £5 5s. For those who hold Perpetual Tickets the fee is £3 3s.

COURSE OF LECTURES ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.
WEDNESDAY, Feb. 27th.—12 noon, Cerebellum: Dr. Kinnier Wilson.
THURSDAY, Feb. 28th.—12 noon, Mesencephalon and Corpus Striatum: Dr. Kinnier Wilson.
The fee for this Course will be £2 2s.
Dr. F. M. R. Walshe will give A COURSE OF EIGHT CLINICAL DEMONSTRATIONS, CHIEFLY ON METHODS OF EXAMINATION OF THE NERVOUS SYSTEM, in the Wards at 10 A.M., every Wednesday and Thursday during February. The numbers attending the Course will be limited. Fee £2 2s.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, Feb. 27th.—3.30 P.M., Optic Atrophy: Mr. Leslie Paton.
The fee for this Course alone is £5 5s. If taken in conjunction with the general Post-Graduate Course the fee is £3 3s. All applications should be sent to the Secretary, Medical School.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

ST. THOMAS'S HOSPITAL, Albert Embankment, S.W.
(In the Governors' Hall.)
THURSDAY, Feb. 28th.—5 P.M., Dr. J. A. Murray: Cancer (Second Lecture).

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, Feb. 26th.—5 P.M., Dr. MacCormac: Desensitisation.
THURSDAY.—5 P.M., Dr. Griffith: Bullous Dermatoses.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
THURSDAY, Feb. 28th.—4 P.M., Mr. Barrington-Ward: Appendicitis.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, Feb. 25th.—10 A.M., Surgical Registrar: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.
TUESDAY, 10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—12.15 A.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients. 2 P.M., Dr. Pernet: Skin Dept.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 11 A.M., Dr. Simson: Gynæcological Demonstration. 2 P.M., Mr. Bishop Harman: Eye Dept.
FRIDAY.—10.30 A.M., Dr. Pritchard: Medical Wards. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, Feb. 28th.—5 P.M., Mr. L. G. Phillips: Infant Feeding.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, Feb. 27th.—4.30 P.M., Dr. C. A. Joll: Malignant Disease of the Thyroid Gland.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, Feb. 26th.—4.15 P.M., Mr. C. Roberts: Surgical Complications of Diabetes.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURE (at Whitworth-street West Branch).
FRIDAY, Feb. 29th.—4.30 P.M., Dr. J. F. Ward: The Internal Secretions in Infancy and Childhood.

MANCHESTER FRENCH HOSPITAL POST-GRADUATE LECTURES.
THURSDAY, Feb. 28th.—4.30 P.M., Mr. A. C. Magian: The Operative Treatment of Prolapsed Ovaries.

SALFORD ROYAL HOSPITAL LECTURES.
THURSDAY, Feb. 28th.—4.30 P.M., Dr. A. C. Sturrock: The Nervous Manifestation of Rheumatism.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, Feb. 25th.—(At the Children's Hospital.) Dr. Murray Bligh: Rickets.
TUESDAY.—(At the Southern Hospital.) Mr. G. P. Newbolt: Surgical Cases.
WEDNESDAY.—(At the Northern Hospital.) Mr. McMurray: Surgical Condition of the Hip-joint.
THURSDAY.—(At the Stanley Hospital.) Dr. Gullan: Aortic Valvular Disease.
FRIDAY.—(At the Royal Infirmary). Mr. Woolfenden: Surgical Cases.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES.
TUESDAY, Feb. 26th.—(At the Royal Hospital.) 3.30 P.M., Dr. Mould: Dementia Præcox.
FRIDAY.—(At the Royal Infirmary.) 3.30 P.M., Prof. Mellanby: Some Recent Discoveries in Therapeutics.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Feb. 27th.—4 P.M., Dr. A. C. Inman: The Rôle of the Laboratory in the Tuberculosis Problem.

Appointments.

BLOOMFIELD, Miss A., M.D. Edin., F.R.C.S. Eng., has been appointed Assistant Surgeon to the South London Hospital for Women.
BORTHWICK, G. A., M.D., Ch.B. Edin., Medical Officer to the Port of Plymouth.
PEMBERTON, H. S., M.B., Ch.B. Liverp., M.R.C.P.Lond., Honorary Physician to the David Lewis Northern Hospital, Liverpool.
SIMPSON, J. V. A., M.D. Lond., D.P.H. Camb., Deputy Medical Officer of Health, Torquay.
WATSON, F. H., M.B., Ch.B. St. And., Medical Officer in Charge of the Maternity Hospital and Clinics, Portsmouth.
Certifying Surgeons under the Factory and Workshop Acts: PORTER, J. H., M.R.C.S., L.R.C.P. Lond. (Littlehampton); KENDALL, G. M. (Epsom).

Vacancies.

For further information refer to the advertisement columns.
Birmingham General Hospital.—Director of V.D. Dept. £600.
Birmingham, Highbury, Uffculme and Sorrento Hospitals.—Med. Supt. £800.
Board of Control. Victoria-street, S.W.—Inspectors. £500 and £400 respectively.
Bristol, Cossham Memorial Hospital, Kingswood.—H.S. £150.
Bristol General Hospital.—Two H.P.'s, H.S., Res. Obstet. O., and Cas. H.S. Each £125.
Canterbury, Kent and Canterbury Hospital.—Res. M.O. £175.
East Suffolk Administrative County.—Asst. Tub. O. £500.
Edinburgh, Chalmers' Hospital.—Surg. O.
Elizabeth Garrett Anderson Hospital, Euston-road.—Hon. Clin. Assts. Also Asst. M.O., V.D. Dept. £1 1s. per attendance.
Evelina Hospital for Children, Southwark, S.E.—Hon. Phys.
Finsbury Metropolitan Borough.—Asst. M.O.H. £600.
Halifax Royal Infirmary.—Hon. Ophth. S. and Hon. Radiologist.
Hertford County Hospital.—Hon. Asst. S.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Hon. Ear, Nose, and Throat S.
Hull Royal Infirmary.—Asst. H.S. £150.
Leeds City.—Asst. M.O.H. £750.
Leicester City Education Committee.—Asst. Sch. M.O. £600.
Leicester Royal Infirmary.—H.S. £150.
Manchester, Ancoats Hospital.—Two H.S.'s. £100.
Manchester Corporation.—Asst. Tub. O. £621.
Melton, Suffolk, St. Audry's Hospital.—Med. Supt. £1000.
Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—Asst. S. H.S. £150. Also Clin. Assts.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. £150.
National Hospital for the Paralysed and Epileptic, Queen-square, W.C.—Asst. P.
Newcastle-upon-Tyne, University of Durham College of Medicine.—Lectureship on Med. Jurisprudence.
Nottingham Children's Hospital.—Res. H.P. £150.
Portsmouth Royal Hospital.—Sen. H.S. £200. Also Asst. H.S. £150.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—Two Asst. Res. M.O.'s. Each £80. Also Sen. R.M.O. £100.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—H.P. and H.S. Each £100.
Royal General Dispensary, Bartholomew Close, E.C.—R.M.O. £175.
St. Pancras Dispensary, 39, Oakley-square, N.W.—Hon. Ophth. S.
St. Thomas's Hospital.—P. Also Ophth. S.
Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.
South London Hospital for Women, South Side, Clapham Common, S.W.—Three H.S.'s and one H.P. Each £50.
University College Hospital Medical School.—Graham Scholarship in Pathology.
Wakefield, West Riding of Yorks.—Temporary M.O. 10 guineas.
West London Hospital, Hammersmith-road, W.—One H.P. and Two H.S.'s. Each £100.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Dinas Mawddwy, Merioneth; Rocester, Staffs.
The Secretary of State for the Home Department proposes to appoint an additional Medical Referee under the Workmen's Compensation Act for the County of Orkney. Applications should reach the Private Secretary, Scottish Office, not later than March 8th.
The Secretary of State for the Home Department gives notice of a vacancy for a Medical Referee under the Workmen's Compensation Act, for the Districts of the County Courts of Barnard Castle, Darlington, and Richmond (Circuit No. 2); and Leyburn and Northallerton (Circuit No. 15). Application for the posts should be addressed to the Private Secretary, Home Office, and should reach him not later than March 8th.

Births, Marriages, and Deaths.

BIRTHS.

BAKER.—On Feb. 9th, at Camden-road, the wife of H. Searle Baker, M.R.C.S., L.R.C.P., of a son.
BRODRIBB.—On Feb. 10th, at St. Leonards-on-Sea, the wife of Arthur W. Brodribb, M.A., M.B. Oxf., M.R.C.S., of a son.

MARRIAGES.

DAVIES—ROSS.—On Feb. 12th, at All Saints' Church, Wigston, Leicester, John Harold Twiston Davies, B.A. Cantab., M.R.C.S., to Isabel, daughter of Mr. and Mrs. S. A. Ross, of Wigston Magna.
GABRIEL—TYSON.—On Feb. 14th, at St. Margaret's Church, Lowestoft, by the Rev. G. N. Selby-Lowndes, assisted by the Rev. E. C. Morgan (Rector of the Parish), William Bashall Gabriel, M.S., F.R.C.S., younger son of the late E. E. Gabriel and Mrs. Gabriel, Oulton Broad, Suffolk, to Evelyn Maud, daughter of Wilson Tyson, M.D., F.R.C.S., and Mrs. Tyson, Lowestoft.

DEATHS.

BLATHERWICK.—On Feb. 12th, at Coleherne-court, S.W., Henry Blatherwick, M.R.C.S., L.R.C.P., aged 65 years.
CURREY.—On Feb. 16th, at Swarthbeck Point, Ullswater, Robert Henry Currey, F.R.C.S. Edin., M.R.C.S. Eng.
GREEN.—On Feb. 12th, Herbert Melvill Green, M.D., of Clarges-street, W. aged 55 years.
HANNAH.—On Feb. 16th, at Woodlands, Ashton-in-Makerfield, Lancashire, in her 81st year, Elizabeth, widow of the late Nathan Hannah, L.R.C.P. Edin., L.F.P.S. Glasg., M.O.H.
JOHNSTON.—On Jan. 23rd, at Sidney, Vancouver Island, British Columbia, George David Johnston, M.R.C.S., L.R.C.P. Lond., in his 72nd year.
JOYCE.—On Feb. 12th, Thomas Joyce, M.R.C.S., at Wood Knowle, Mayfield, Sussex, in his 90th year.
MARDER.—On Feb. 3rd, at Burley, Lyme Regis, Edward Swan Marder, Major, late R.A.M.C., aged 64 years.
THOMSON.—On Feb. 13th, at Ivy Dene, Sweyn-road, Margate, Robert Thomson, M.D., M.Ch., aged 62 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

DOCTORS* AND ADVERTISING.

BY HAROLD D. L. SPENCE, M.D., M.CH. ONT., M.R.C.S. ENG.,
LATE CHIEF ASSISTANT, SKIN DEPARTMENT, ST. BARTHOLOMEW'S HOSPITAL.

As a profession we express, or there is expressed for us, a certain abstract abhorrence of advertising or advertisement; but a serious difficulty is encountered immediately we proceed to determine just what constitutes advertising.

We know that it has been contended that a doctor named in the Court Circular column of a daily newspaper as being a relative of a bride was advertising, as these notices are charged at so much per line—but it is inconceivable that such an item would be calculated to bring patients to the doctor's door, the ideas being in no way associated. Yet the statement in the more widely read news columns of the same newspaper that Sir Jupiter Pluvius, the astronomer, is progressing satisfactorily after an operation for appendicitis performed by Mr. Joshua Whatnoodle, the very eminent surgeon, is not to be mistaken for advertising, being either news or a gratuitous tribute to worth and achievement. Here is surely what undergraduates term a distinction without a difference—since advertising value is measured by results; and in the commercial field, if I may be permitted to make the comparison, a free advertisement, possessing a unique impersonal quality in the guise of reading matter, may prove invaluable whereas the most expensive space may be utterly wasted.

On the same occasion reference is understood to have been made to the "bulletin," and here complainant was on firmer ground; for this must be the most useful form of professional publicity. The names appended reach millions of newspaper readers in the most favourable setting, the nature of the illness is known, and it seems a reasonable assumption that a wealthy or prominent patient will secure the ablest professional attention in the circumstances. Again we are loftily told that this too is not advertising. Assuming that this is so it is strange that in my scrap-book, containing examples of every conceivable kind of professional publicity from the timid personal item to raging propaganda, I find nothing approximating to the following hypothetical signed bulletin: "Lord Algernon Debrett who was operated upon yesterday for appendicitis became gradually weaker during the afternoon and expired early to-day."

It may be permissible to suggest that whilst there are exceedingly few of us who really object to the publicity which it denotes, there is practical unanimity in the dislike of the unpleasant word *advertising*, which as medically misused has become a term of opprobrium, with a confused suggestion of sky-signs, cure-alls, slogans, and registered trade-marks. Professional publicity has always existed in one form or another. If the modern newspaper is the most important, it is by no means the only medium of publicity employed by the profession: and unless the character of the act is determined less by its own intrinsic quality than by the number in the audience to which it is directed, it is clear that we can as little attack one form of publicity whilst conveniently ignoring the others as we can condemn in one individual what we condone in another—for to do so is to justify a suspicion that our attitude towards publicity is somewhat complex.

The layman, knowing little of the prejudices and rivalries apparently inseparable from so individualistic a calling as our own, is at a loss to understand the good friend who seems threatened with imminent apoplexy upon observing that a colleague is given prominence in the day's news or is pictured with other interesting people in the illustrated page. No one is more jealous of reputation than the barrister or clergyman, but it is open to either to contribute freely to lay publications, and it is never suggested that the standing of the great craft of the law or of the noblest of professions is lowered in consequence. An Ethical Committee very commonly assumes an authority it by no means possesses; and since amongst its members are inevitably those who are apprehensive concerning any departure that seems novel or calculated to disturb the uneventful progress of a placid or semi-vegetative existence it hastens to label as improper anything of which its members personally disapprove. As a matter of fact, the doctor possesses a complete and unassailable right, both legal and moral, to secure publicity in certain ways if he so desires, equally with the barrister and clergyman, provided always that he is careful to respect the rules of professional honour; and once we recognise this elementary truth it becomes no longer necessary to infer, with polite dissimulation, that well-written articles or synopses of lectures complete with name, degrees, and studio-portrait appear in a newspaper accidentally or represent a reluctant capitulation to the persistent importunacy of editorial perseverance or pragmatism.

Long ago John Stuart Mill wrote: "There has been much complaint of late years, both in the world of trade and that of intellect, of quackery, and especially of puffing; but nobody seems to have remarked, that these are the inevitable fruits of immense competition, of a state of society where any voice not pitched in an exaggerated key is lost in the hubbub."

It is impossible to view with complacency the employment by professional men of undignified or blatant methods of publicity, for improper methods not only recoil upon the individual but bring the whole profession into contempt. Equally indefensible, however, is the attitude of the few who would have the doctor, following a large capital outlay for education, premises, and equipment, virtually immure himself within brick walls after the manner of monks and ascetics in the Middle Ages. There is a "mean" here as in all things, and it would be well to recognise this quite frankly. Regulations which repress are always broken, and particularly is this so where it happens that, contrary to the Euclidean philosophy, the part may be greater than the whole.

If the intelligent professional advertiser benefits himself he also benefits the profession. Putting it on the lowest basis, every patient treated by a fully trained and competent practitioner represents an economic saving to the community as well as a score at the expense of lightning cures or osteopathic, spondyloplastic, oscillo-clastic, or mechano-therapic clap-trap. The extra-professional advertiser is, however, a very damaging competitor.

Some ten million pounds was spent last year in this country for patent medicines. I invite readers to judge in what proportions this was due to (*a*) the patient's inability to find the right practitioner or specialist; (*b*) the professional habit of pooh-poohing minor ailments, real enough to the patient, and (*c*) the tendency of many doctors to play the pharmaceutical manufacturer's game and recommend a proprietary mixture or pseudo-scientific nostrum, whether through laziness, carelessness, or ignorance of the contents of that excellent work, the British Pharmacopœia.

The General Medical Council have indicated that they hold in special disfavour publicity which tends to disparage the work or abilities of professional colleagues, and a reference to the pages of my scrap-book quickly discloses examples which seem, either directly or through the inference conveyed, to fall foul of this injunction. It is also very interesting to note through contrasts in individual method how practice may be aggressive without raising invidious distinctions or giving rise to the least suggestion of impropriety. The bacteriologist, a complete and unquenchable therapeutic optimist, has long enjoyed a good press; but further, he may distribute his products through the sales organisation of the wholesale chemist, or becoming a "laboratory" join business and profession in a quasi-sanctified union. Thus a liaison is secured with a wider clientèle, using methods which I consider entirely in harmony with correct ethical principle. Let us now compare with this a certain lack of dignity, which we must attribute to the hyperbolic enthusiasm of the descriptive journalist, in the three-quarter column newspaper announcement that a group of "famous doctors" are prepared collectively to supply the "best advice" for a price much less than the individual fees would aggregate, indeed for "a fourth or in some cases a fifth of these sums." Anti-venereal advertising presents unique features, and is at variance with the dictum of the General Medical Council, if only in the unblushing use in lavatory announcements and other literature addressed to the public of the word "expert," perhaps the most abused in our language. If it be questionable form for an individual, whatever his attainments, to describe himself as an "expert" it is equally wrong for two, three, or a half-dozen individuals, constituting the staff of a venereal clinic, to pronounce the word in unison, for this is precisely what it amounts to. Again, those of us who have served for any length of time in venereal hospitals or clinics know that whereas it is the conceit of the attending doctor to increase the attendance on his day, and the *business* of the astute and enterprising caput-counting secretary to increase the attendance on each and every day, it is very often the affair of no one in particular to discover

* For the purposes of this paper the word "doctor" is used in the generic sense understood abroad. It is hoped that nothing written will be construed as referring to any individual, the intention being to present a point of view widely held in a quite impersonal way.

whether a certain patient is or is *not* entitled to free treatment; and so it happens that, the clinic being supported from public funds, the private practitioner is in the extraordinary situation of personally contributing money through taxes towards the support of a clinic, which is not only actively *competing* with him, but is permitted to attract new patients by means which he as an individual is forbidden to employ.

Major abuses of professional etiquette and privilege, including the improper use of advertisement, bear a curiously constant inverse relation to the educational and professional acquirements of the individual, whence it would appear that the most effective method of combating them lies in prophylaxis, through a sustained effort to increase the prestige of the profession, both individual and collective, by raising educational standards. The American Medical Association has demonstrated the useful work that an ably conducted national association with no executive powers can perform in improving the standing of the profession it represents. For twenty years its Council on Education has persevered in a campaign designed to improve the equipment and quality of the American practitioner. So successful has this been that the number of medical colleges has been reduced through the elimination of weaker institutions from 162 to 95, and the students enrolled from 28,142 to 17,432. Of the latter number 94 per cent. attend class "A" schools, requiring before admission two or more years of university attendance and in some cases—e.g., Harvard—a literary degree (B.A.), and conforming in the course of study provided to what is regarded as an "ideal" standard. Endowments have increased in the interval; better hospital relations have been secured; plant, laboratories, and teaching methods continuously improved; and medical education in the United States to-day probably equals, if it does not surpass, that of any other country. Concurrently a very real service has been rendered the profession by its Council on Pharmacy in the systematic investigation of new remedies, and unrelenting war waged against the nostrum evil and towards "cleaning" the advertisement pages not only of the medical but of the lay press, the *Journal* of the American Medical Association itself furnishing a notable example in this particular. I suspect that regular readers of its weekly "Propaganda for Reform" column can be little impressed by colloidal magic, nor are they likely to prescribe greaseless massage cream flavoured with glycerophosphates to be taken internally as a great tonic restorative.

HOUSING STANDARDS: HOW THEY MAY BE RAISED.

A Chadwick public lecture was delivered by Dr. A. K. Chalmers at the Kensington Town Hall on Feb. 15th, Sir James Crichton-Browne being in the chair, and repeated on the 18th at the Goldsmiths' College Lecture Hall, New Cross, Sir William J. Collins presiding. Housing customs in England and Scotland were contrasted, and Dr. Chalmers referred to the initial difficulty in use of terms. A "tenement" in Scotland is usually a building of three or four storeys, with each floor divided into two or three or more "houses"; in England, as a rule, the terms are reversed—the whole building is the "house," and the separate occupancies are the "tenements." As a common term, the house may be regarded as the accommodation required for home and family life. When the house is "made down" to accommodate several families, the primary services—water-supply, drainage, ventilation—originally designed for one family, are all modified and frequently impaired. As a rule the house in England has more rooms than the house in Scotland, but the rooms of the house in Scotland tend to be larger. The one-apartment house is a common feature of Scottish housing. It combines the functions of the living room, scullery, and bedroom. Sculleries were not common in small houses in Scotland until recent housing schemes. After referring to the effect of climate on constructional requirements, the lecturer commented on the early aspects of housing questions and the Chadwick report. He also pointed out the association between indifferent housing, inadequate food, poorly paid labour, and ill-health. Illustrations of association between bad housing and bad health were shown in a series of lantern slides.

Dr. Chalmers dealt with the movement for improving the dwellings of the working classes, showing how the cessation of house building during war years had raised acutely the question of a housing shortage, and led subsequently to a return of the older problem of the improvement of slum areas. Indifferent success had met the efforts to solve the problem in the nineteenth century. As to the question of standards, the Housing Acts and building regulations define these in a degree. The primary requirements of healthy housing are obviously a pure water-supply and an adequate system of refuse removal. Absence of these is commonly associated with other defects in the construction of the house, its design and relationship to other buildings. The Housing Act of 1890 focused and amplified earlier legislation. Building regulations were complementary to the clearance of insanitary areas. Among other purposes they were intended to prevent overbuilding of sites, and to provide free circulation of air and adequate lighting of rooms. The width of the street in relation to height of buildings facing it was an important factor. Efforts to obtain adequate lighting and ventilation of back rooms were detailed. The inflexibility of building regulations was often a drawback, and the desire in New York to adapt them to the needs of particular areas by a system of "districting" showed that this was the case in other countries as well as here. The orientation of streets in relation to available sunlight was an important feature of town-planning. There was an advantage in streets running diagonally with the cardinal points of the compass. Dr. Chalmers concluded by showing how density may be measured, and showed the relative value of floor area and height of ceilings in relation to number of persons per room. Under building regulations the gradual enlargement of the room in houses erected might be noticed. There was improvement in the smaller houses, but the tendency to increase the number of rooms at the expense of the floor area of individual rooms, and especially of the area of sleeping apartments, could not be accepted as final.

"POISONED DAMSELS."

To the Editor of THE LANCET.

SIR,—I am bringing out a 10-volume edition of a collection of Sanskrit stories known as the "Kathā Sarit Sāgara," and they are being fully annotated by myself. In one of these stories we read of a king who, when about to attack another king, first sent spies into the country and also despatched "poisoned damsels." It appears that these "poisoned damsels" were brought up from childhood on the poison of snakes until their whole system became full of poison. So much so that any connexion with them, or sometimes even their kiss would kill a man. Some writers have suggested that this may refer to syphilis. Personally, I do not for a minute think it does, but I would like to know, on the best authority, the earliest date that syphilis has been traced in India. I believe it was introduced by the Portuguese at Goa. Are there any records of poisons of any kind, particularly snake venom, being used to cause death either through the touch or by putting it in food, drink, or clothing?—I am, Sir, yours faithfully,

N. M. PENZER.

12, Clifton-hill, St. John's Wood, N.W., Feb. 18th, 1924.

DANGEROUS DRUG RECORDS.

WE have received specimens of a new edition of the Prescribers' Card, issued by the *Chemist and Druggist* (42, Cannon-street, London, E.C. 4) for the use of medical practitioners in prescribing scheduled dangerous drugs. The information given is concise and complete, while the handy size (7 by 3½ in.) of the card makes it suitable for the desk or pocket. The new edition embodies the changes brought about by the Dangerous Drugs and Poisons (Amendment) Act, 1923, and the Regulations issued since the issue of the first edition in 1921. The cards are supplied in quantities of one dozen at 1*s.* 6*d.* post free.

THE "MANETOR" COOLING-COMPRESS.

THE "Manetor" consists of small perforated discs of a hygroscopic earth which are joined together in the form of a ribbon or other shape for application to the forehead, neck, wrist, and præcordial and other regions of the body. For use it is soaked in water for a minute or two, the superfluous moisture dried off, and the apparatus applied to the skin, the required coldness being produced by evaporation. The apparatus may prove useful in the sick-room so far as it gives relief to the patient—and it is sometimes very difficult to separate what is physical from what is suggestive—but time is necessary to show whether it can take the place of the ice-pack, Leiter's coil, or other apparatus of the kind. Messrs. Norman Patterson and Co., Ltd., 150, Southampton-row, London, W.C., are the manufacturers.

AT the February meeting of the Council of the Society of Members of the Royal College of Surgeons of England Dr. Sidney C. Lawrence was presented with an illuminated address in appreciation of his services as hon. secretary of the Society for the past 15 years.

Intravenous Treatment of Syphilis.—The new preparation, "Flumerin," which was the subject of an article by Dr. W. R. Snodgrass in THE LANCET of Jan. 19th, is supplied by Messrs. Hynson, Westcott and Dunning, of Baltimore, Maryland, U.S.A. The preparation is put up in boxes containing 12 sealed tubes containing at choice 0·15, 0·2, 0·25, or 0·3 g. powder ready for solution—also in 5 g. ampoules for hospital use.

A Lecture
ON
BREAST-MILK FEEDING.[1]

BY CATHERINE CHISHOLM, M.D. MANCH.,
HON. PHYSICIAN FOR CHILDREN, NORTHERN HOSPITAL, MANCHESTER, AND HON. PHYSICIAN, MANCHESTER BABIES' HOSPITAL.

BREAST-MILK from its own mother is the only suitable food for the new-born child, and every child has a right to it. This fact emerges more and more clearly from the study of infant feeding and its results. Further, it may be a vital necessity for which no substitute can be found in the case of the premature child, or the victim of serious dyspepsia or any form of food intolerance. It is, therefore, to review our knowledge and to report the result of personal experience that this lecture is given, in the hope that it may afford some help to those who need it. That the information is needed is obvious, since those who have been practising among infants all their medical lives have had to seek out and learn so much.

Though all doctors and nurses continually advise breast-milk, there has been too little teaching and, indeed, too little study, into the best way of preserving the supply for the child and of ensuring its proper quality. For, as McCollum observes, the statement, so frequently reiterated, that breast-feeding of infants is superior to the best system of artificial feeding, needs to be qualified to some extent. There are, without question, in many parts of the world, large groups of people whose diets are such that the milk produced by the lactating mother is not a satisfactory food for the infant.

We are obviously concerned in managing breast-feeding with (1) mother and (2) child. As far as the mother is concerned, we may consider (*a*) character of the milk, (*b*) mechanism of secretion. In the child we consider (*a*) its power of suction, (*b*) its digestion and metabolism. As in other branches of medicine our practice must be based on physiological principles.

THE MOTHER.

The breast gland has been preparing for action during the whole life of the mother. Gaines[2] sums up the progressive stages in the development of the mammary gland as follows :—

"Embryonic Stage.—The first signs of mammary organs, the milk line, appear at an early stage in embryonic life, and growth is continued until the gland reaches a considerable development at birth.

Birth.—At birth a milky fluid may be expressed from the gland in either sex (the so-called witch's milk), indicating secretory activity, but this activity soon ceases and the gland remains quiescent until puberty.

Puberty.—At puberty, under the influence of the ovaries, growth is resumed and carried to a greater or less development, varying with the individual and the occurrence of pregnancy.

Pregnancy induces a great hypertrophy of the gland, and it reaches a high state of development, accompanied by the accumulation of colostrum.

Delivery.—By the time of delivery milk secretion proceeds actively, and if the milk is removed at short intervals by nursing or artificially secretion continues for a period of days, months, or years. The rate of secretion, however, after a time gradually decreases to zero. This decrease is favoured by a succeeding pregnancy.

Pregnancy.—Further growth of the gland ensues, but not as marked as in the preceding gestation.

Delivery.—At delivery milk secretion is again actively resumed. Whence the pregnancy cycle is repeated."

The following theories of the immediate process of lactation are held.

Lane-Claypon and Starling[3] think particular substance passes from fœtus to maternal circulation—stimulating and inhibiting the action of the gland in producing the milk during pregnancy.

(1) Increased blood in circulation after fœtus is gone provides material which is then secreted by the breast whose activity, like other glands, is increased by extra supply of blood; or (2) particular substances in blood favour secretion either (*a*) by purely stimulating the gland or (*b*) are of actual food value—i.e., that the food of the suckling is a direct continuation of the process of feeding the fœtus. (Pfaundler in Sommerfeld's Handbuch.)

SECRETION OF MILK.

Our knowledge of the complicated process of milk secretion may be summed up, according to Heinemann, as follows :—

"Epithelial cells take up material from the circulation and transform it into milk constituents, then discharge the altered substances into the lumina of the alveoli, and here the secretion is worked over into the finished product. The cells contribute from the chromatin and protoplasm part of their substance to the secretion and ultimately disappear. Part of the body fluid enters the gland ducts, which become distended and attract leukocytes, which, in turn, aid in the regeneration of cells partly by furnishing food and partly by removing degenerated cell substance. With the progress of lactation the leukocytic infiltration increases again, and at the end of lactation cell products are reabsorbed."

Gaines expresses the extent of our knowledge of the milk-flow in the following words :—

"During milking and nursing there is a reflex constriction of the gland; the removal of the milk from the gland is dependent upon the operation of this reflex; and the reflex is conditioned. The stimulation which naturally excites the reflex must be found in the friction and warmth of the sucking action of the young on the cutaneous sense-organs of the teat; with possibly a further source in the passive dilation of the sphincter muscle of the nipple by the passage of milk." Further: "Milking is a stronger excitant than an inserted canula; nursing is stronger than milking and direct action of pituitrin is stronger (*for the moment*) than nursing. Removal of milk from the gland is dependent upon this (nursing, &c.) reflex and it may be completely inhibited by anæsthesia. The psychic state of the mother modifies the strength of the reflex as shown by the flow of milk after absence of the young."

CHARACTER OF THE MILK.

The main constituents of normal breast-milk, as is generally known, are protein, lactose, and fat. Milk-sugar is only found in milk. If the milk gland is extirpated milk-sugar disappears from urine. Casein is a protein found nowhere in the body except in the mammary glands. There are two theories of its production: (1) enzyme action in gland, and (2) pairing of blood constituents and cellular material. The origin of lactalbumen is also obscure. From these proteins tryptophane, a split product of protein of especial value to growth, has been shown to be present in large proportions in both casein and lactalbumen, particularly in lactalbumen, the predominating protein in human milk (2·5 per cent. in casein, 4·0 per cent. in lactalbumen).

Milk-fat is not like body-fat. Heinemann says :—

It was formerly believed that milk-fat was the result of fatty degeneration of proteins, and that upon standing the quantity of milk-fat would increase at the expense of casein, but many observations have shown clearly that the composition of milk-fat is influenced by the fat in food. This fact has led to the belief that fat from food passes directly into the milk. However, this is not a necessary conclusion, because fat may be assimilated as body-fat and then reach the milk glands as such, or it may be broken down into building stones and then synthesised by the milk glands into milk-fat. In either case the resulting milk-fat would be dependent, in a measure at least, upon the original fat taken from the food and would have a similar composition. That such is the case is shown by comparison of the iodine number of body-fat, colostrum-fat—which is formed during a transition period—and genuine milk-fat.

The following table given by Engel, and taken from Sommerfeld's "Handbuch," illustrates the point.

It shows that while there is some difference between the iodine numbers of body-fat and colostrum, which might be expected, there is a much greater difference between body-fat and milk-fat. If the theory is correct that colostrum is a transition product between body fluids and milk, it would follow naturally that the fat of colostrum would also be a transition product. Extensive investigations by

[1] A post-graduate lecture delivered at the Manchester Babies Hospital.
[2] American Journal of Physiology, 1915, xxxviii., 285.
[3] Proceedings of the Royal Society, 1906, lxxii., 505.

Engel (quoted from Pfaundler in Sommerfeld's "Handbuch") have led to the conclusion that milk-fat is not identical with body-fat, but that, since the iodine numbers of milk-fat and body-fat are approximately proportionate, there must be a dominating influence of body-fat upon milk-fat. Milk-fat, therefore, is dependent upon body-fat, but is not identical with it. Consequently, body-fat is either not the exclusive source of milk-fat, or the milk glands transform the body-fat into milk-fat. Colostrum-fat, however, is nearly identical with body-fat, while later fat formation is influenced also by the character of the food. The composition of milk-fat may fluctuate, therefore, according to which one of the two sources is predominant. However, the influence of the source of milk-fat is limited, since it is known that each species of mammal produces milk-fat of characteristic composition, so we must assume that there is a standard composition of fat derived from the milk of a certain species. This standard is variable only within narrow limits.

Engel's Table.

Mammal.	Iodine number of—		
	Body-fat.	Milk-fat.	Colostrum-fat.
Cow ..	42·0	32·0	46·1 to 50·5
Goat ..	44·1	37·0	46·9
Sheep ..	45·0	39·0	46·8
Human ..	61·5	43·0	62·0
Dog	72·7	58·3	—
Ass	78·2	72·0	—

The source of milk-fat has been investigated by Jordan and Jenter in a carefully controlled experiment. Recognising that many previous experiments did not cover a sufficiently long period of time, these authors fed a cow for 95 days on a ration from which the fat was nearly all extracted. The cow

"continued to secrete milk similar to that produced when fed on the same kind of hay and grain in their normal condition. The yield of milk-fat during the 95 days was 62·9 pounds. The food-fat eaten during this time was 11·6 pounds, only 5·7 pounds of which was digested. Consequently at least 57·2 pounds of milk-fat must have had some other source other than the food-fat. The milk-fat could not have come from previously stored body-fat, because, (1) the cow's body could have contained scarcely more than 60 pounds of fat at the beginning of the experiment; (2) she gained 47 pounds in body-weight during this period of time with no increase of body-nitrogen, and was judged to be a much fatter cow at the end; (3) the formation of this quantity of milk-fat from the body-fat would have caused a marked condition of emaciation which, because of an increase in body-weight, would have required the improbable increase in the body of 104 pounds of water and intestinal contents. During the 59 consecutive days 38·8 pounds of milk-fat were secreted and the urine nitrogen was equivalent to 33·3 pounds of protein. According to any accepted method of interpretation not over 17 pounds of fat could have been produced from this amount of metabolised protein. The quantity of milk solids secreted bore a definite relation neither to the digestible protein eaten nor to the extent of the protein metabolism. In view of these facts it is suggested that the well-known effect upon milk secretion of a narrow nutritive ratio is due in part to a stimulative, and not wholly to a constructive, function of the protein."

The authors also state that "the composition of the milk bore no definite relation to the amount and kind of food" and that "the changes in the proportion of milk solids was due almost wholly to changes in the percentage of fat."

The results of Jordan and Jenter's experiment appear to demonstrate that food-fats bear no necessary relation to formation of milk-fat. Protein metabolism can account only for part of the fat secreted in the milk, and some of the fat must have been derived from carbohydrates.

The assumption appears to be justified that milk-fat is derived from four sources—namely, food-fat, body-fat, protein, and carbohydrate. It is the function of the milk glands to transform these substances into milk-fat, and they produce a fat which varies but little from a standard suitable for the food of a certain species. It is true that the chemica composition of milk-fat in the same kind of milk varies within limits, according to the kind of fat contained in the food consumed. However, such variations are not permanent, and after a short period the normal constitution of the fat is restored, even when a particular fat is eaten with the food for a long time.

ACCESSORY FACTORS PRESENT IN MILK.

Immunising Bodies.—These are also present, particularly in the colostrum, which emphasises the importance of breast feeding even where it can only be carried on for two or three weeks. At birth the child has no capacity for providing its own resistance to the invasion of foreign substances.

Vitamins.—Ferments (lipose, lactose). Slight, if at all (Lane-Claypon).

A review in 1917[4] of the variations in chemical composition during the first 11 days shows that the order of variation in any group of individuals and also in any individual from day to day is fat, protein, lactose.

1. For each constituent there is a production plane and this plane is fixed for the individual, independent of nutrition and is dependent on the individual.
2. Little can be done to alter the proportions of the constituents by feeding.
3. An increase or decrease in lactose is accompanied by a change in the opposite direction in percentage of fat and protein.
4. Protein mechanism is best regulated and less dependent on factors controlling fat and lactose than they are on each other.

Drugs Appearing in Milk According to Holt.—These are: Saline cathartics, arsenic, salicylates, belladonna in full quantities, opium in poor milk may be dangerous, iodides, bromides, and mercury after prolonged use.

VARIABILITY OF MILK.

Variability of milk is seen in:—

1. Difference in composition due to breed.
2. Difference due to individuality—a superior individuality is one capable of using food in quantity above that required for maintenance and using its excess for milk production (Eccles and Reid).
3. Difference in same individual,[5] (*a*) at different milkings; (*b*) morning and evening milking—fat is richer in morning than at night; (*c*) fore, mid, and stripping; (*d*) according to length between meals—after long intervals percentage of all constituents is higher.
4. Difference in individuals during lactation. Quantity diminishes at the end of lactation but the solids increase. Fat is most variable, but protein rises considerably. In humans total nitrogen content falls. Fat declines for three months, then is constant four to five and rises at the end in cows. Sugar declines at the end. With regard to materials in diet of mother affecting milk, mothers in the fourth century were not allowed to take salt, acids bitter or sweet, or anything with a strong or fragrant odour. The substances giving flavour are said by Myers to be purely aromatic acids.[6] Certain drugs are known to affect the milk of the mother. With regard to vitamins, McCollum and Simmonds have shown that unless the nursing mother is receiving a diet rich in fat-soluble A-vitamin the growth of the young is unsatisfactory, though for a time her body has a reserve store. The mother is able, for a time, to produce water-soluble B-vitamin from her reserve supply, though it is not in the food. They showed that inorganic salts also were necessary in her diet though, again, for a time she is able to draw on her own reserves. They point out "that the human mother should have in her diet a liberal amount of milk . . . and of leaf vegetables." It is not enough that the diet shall furnish enough

[4] Journal of Biological Chemistry, 1917, xxix., 381.
[5] See Heinemann, Milk, 1919, p. 106.
[6] Myers: American Journal of Obstetrics.

aloric value and enough protein and shall afford ariety and palatability.

5. The influence of food is that when poorly-fed ows are placed on a well-balanced milk ration, roduction and quality are improved. But this hange cannot go beyond the limit which breed or ıdividuality is capable of producing.

$$\text{Nutritive ratio} = \frac{\text{carbohydrate} - 2\frac{1}{4}\text{ fat}}{\text{protein}}$$

6. Influence of weather is not of much importance. 'at and not fat solids are both down in summer. 'resh air and sunlight are of advantage.

7. Influence of exercise reduces milk and increases at. Nervous influences are important. Worry educes quantity, probably increases proteins, and ecreases fat.

8. Skill of milker.

The foregoing shows the difficulty of attempting o alter the character of the milk by dieting. The ollowing principles apparently guide the quality of he milk and the possibility of altering it for the hild.

(*a*) That the main factor is the inherited nursing apacity of the mother and her individual type of ilk which produces a certain ratio of fat, protein, nd carbohydrate.

(*b*) That, within limits, she draws on her own body issues for the sake of the child and even if underfed or a time produces a fair supply.

(*c*) The normal quantity is only increased by dministering to her a properly-balanced diet of ufficient quantity if she is underfed. If she is overfed nd under-exercised her health suffers and so does the uality of her milk.

(*d*) The later part of the feed is richest in fat and onsequently, for a time, the diet may be increased or mited in fat by totally exhausting the breasts or eding light on the two breasts rather than emptying ne fully.

(*e*) That as a longer interval between milking gives lower fat-content, the food can be varied in this way.

(*f*) That the administration of fats, such as linseed il, cod-liver oil, &c., for a time increases the fat-ontent of the milk, which, however, fairly soon ettles down to the mother's normal, and the continued alue of the administration of large quantities of ilk, of oatmeal, and of cod-liver oil is probably ı the vitamin and salt-content of the food (which IcCollum has shown is transmitted to the child nd which contains growth-producing powers) rather han in the improvement of the fat or protein onstituents.

(*g*) That the supply in quantity depends to a certain xtent on the demand. Budin shows this very clearly. f the breasts are well emptied the supply keeps up— the demand is lessened the quantity diminishes.

Thus, even if the character of the milk is investigated, ttle can be done to alter it by dieting a well-fed ıother. The examination of the milk is of most nportance in order to know what the baby is having nd to guide any supplemental feeding. As Hess, of hicago, says, "No baby should ever be deprived of s mother's milk only because of the results of a linical examination of the milk."

When examining milk we must note at what time f day it is taken, and see that a whole milking is aken, or that first and last portions are mixed, or hat the infant is allowed to nurse not more than wo minutes, and a sample is then taken.

Next we must consider the child's part in sucking efore going on to the practical application of these acts in the method we adopt for breast-feeding. The ucking apparatus consists, according to Feldman,[7] of he tongue, the hard and soft palates, the two cheeks, he uvula, the gums, and the lips. The pad, or so-called uction cushion, of fat is within the cheek and is the ze of an almond and remains even when the child is ery emaciated. Auerbach [8] believes that the cheeks are passive and that their indrawing is due to change of pressure inside the mouth. He thinks the nipple is grasped and compressed by the hermetically closed lips, the jaws, and the tongue, whilst the naso-pharynx is shut off behind the uvula. The depression of the lower jaw, with the consequent sinking of the floor of the mouth and tongue, increases the longitudinal diameter of the oral cavity and creates a diminished intra-oral pressure. In this way the milk is drawn into the mouth as the result of compression of the nipple as well as by the negative pressure. Basch found, by means of a special dynamometer, that the force of compression by the jaws is equal to 100–300 g. during the first few weeks of life and to 800 g. in children a few months old. He further determined, by means of a manometer, the suction energy of the child and the pressure under which the milk flows from the breast of the mother, and he came to the conclusion that without compression of the nipple by the lips and jaws the negative pressure alone is not sufficient to overcome the muscular tone of the nipple. Cramer disagrees with that opinion and believes that the aspiration force alone is quite capable of drawing the milk from the breast. The question is not altogether of academic interest. It has some practical importance, inasmuch as in the choice of a wet nurse it is desirable that the pressure required to draw off the milk from the woman's breast should correspond with the suction energy of the infant.

Cramer found that it took a baby five minutes to empty a bottle of 100 g. of milk under pressure of 5 cm., whilst a breast baby sucked 50 g. in 30 minutes under pressure of 50 cm.—i.e., the breast baby did 60 times the work of the bottle baby for half the result. Gundolme, quoted by Feldman (p. 451), found work of bottle baby : breast baby :: 1 : 11. This work of suction calls on (1) salivary secretion, (2) the use of muscles of jaw to help growth of bone.

Capacity of Stomach.—Pisci and Le Wald [9] showed the stomach emptied in three hours. The speed varied with quantity and quality of food. Willox [10] found in gastric radioscopy in children that (1) the shape of the stomach alters in digestion, and (2) the average time of emptying is 3¾ hours—the more fluid the food, the quicker being its passage through the stomach. Holt gives the capacity of stomach at birth as 1·2, at 2 weeks 1·5, and at 4 weeks 2·0. X ray examination shows that during a meal the milk spurts into the duodenum before the meal is finished, this being more commonly the case in naturally-fed babies than in artificially-fed babies.

Jefferson [11] has well shown how this takes place by describing the musculature forming a funnel for the direct passage of fluid on to the pyloric orifice. Observation on the amount of milk taken at a feeding by the normal breast-fed babies shows that the milk must pass directly on through the stomach, for the supply taken is greater than the capacity of the stomach. An infant of one month growing rapidly and on four-hourly feeds may take 6 oz. at a feed.

PRACTICAL APPLICATION.

Mothers feeding infants should have a full, well-balanced diet of the amount to which they are accustomed and containing milk and green vegetables. They should have plenty of fresh air and sufficiency of exercise which does not fatigue, an adequate amount of sleep, and no worry. The feeds should be given at regular intervals. The breasts should be prepared beforehand by painting the nipple with spirits and very gently drawing it out so that the erectile tissue may be developed. When the child is born it ought to be put regularly to the breast at fairly frequent intervals both to stimulate the milk and to involute the uterus, but the mother ought not to be unduly tired. For the first two days she may be full of aching pains. The intervals should be four-hourly the first day, then every 2½ hours till the milk is

[7] The Principles of Ante-natal and Post-natal Child hysiology, p. 448.
[8] Du Bois Raymond's Archiv f. Physiol., 1888, lix.
[9] Trans. Amer. Pediat. Soc., Chicago, 1913, xxv., 150–165.
[10] Practitioner, 1915, xcv., 599.
[11] Journal of Anatomy and Physiology, 1915, 165.

coming well. As soon as possible the child may then be put on three-hourly feeds, and if strong, on four-hourly feeds. If the milk does not come the child should be given a little sugar-water after it has exercised itself on the breast, but it must not be given the sugar-water first as it needs a hungry child to pull well. The child, however, must not be left hungry long or it loses patience with the breast and also begins to lose energy itself. A child does not bear long starvation, especially if it is very tiny.

The child should be wakened to be fed at the proper time. As a rule, one breast only should be given, but under the following circumstances both may be given: (1) during the first few days to stimulate secretion; (2) to weak babies; (3) to overfed babies, so that they do not empty the breast, and get a meal light in fat; (4) where the milk is failing, so that the full stimulus may be exerted and because it needs both breasts. In this case the first must be thoroughly emptied and the second used first at the next meal. Dr. Lucy Naish describes the aversion or predilection of the child to one breast, which partly accounts for some children getting more at one than another meal. She also points out the proper position of the child when nursing—namely, lying across the mother who has a pillow under the arm supporting the child. This gives a slightly raised position to the chest and head of the child. This, in my opinion, is an important point where there is any tendency to vomit, as it allows the air bubble in the stomach an opportunity of escape. The child should not be allowed to take the food too quickly, and an opportunity for allowing air from the stomach to escape should be given by raising the child once or twice during the meal. If the child is very weak and cannot pull on the breast the milk must be drawn off and the baby fed with a bottle or Breck feeder rather than a spoon in order that his muscular powers of suction may increase. If he is too weak, of course, a spoon or pipette is necessary. If the nipples are very poor, again milk must be drawn off by a pump or a nipple-shield used till the nipple improves. As the child is fed and grows stronger it will be able to pull on the breast. The attempt to breast-feed ought not to be given up readily. I have known it take a month to really establish breast-feeding, which has then gone for five months without trouble.

Fats.—Lactagol will for a time enrich the milk and may for longer encourage the flow but the primary enrichment soon goes. Massage, hot douches, and sinusoidal electricity can also be of value to assist in keeping the supply of milk. The technique of electrical treatment is as follows: Gentle massage for ten minutes with the hands oiled and well soaped in hot soapy water, only using a kneading movement, avoiding the nipples. Remove traces of soap, &c., with warm water, dry the breasts, and apply faradism. Use fairly large lint pads soaked in warm water—having cut out centre of pad to avoid touching nipples. Use a piece of metal gauze as electrode, also with centre cut out; fix with bandage. Give just enough current for patient to feel a pricking sensation. Give on alternate days, beginning with 10 and increasing to 20 minutes.

As to quantity—"Let the child on the breast drink according to its appetite" says Variot—and this is wise within limits. If the child is progressing satisfactorily it is sound advice. The child will take very different amounts at different hours in the same day, six ounces at one feeding and two ounces at another. The breast-fed child is, on the whole, more likely to suffer from under-feeding than over-feeding. On the other hand, some children do appear to demand too much food, with consequent sickness.

As to time, the child gets all the milk it is going to get in the first few minutes. It is useless to leave it for a long time in order to get more. It is, of course, necessary for it to empty the breast in order that the supply may be preserved, so it does not do to hurry the child too much. Smith and Merritt [12] conclude that a normal baby who gets milk from one breast needs to be nursed only from six to eight minutes, rarely from 10 to 12 minutes.

A baby on both breasts may be nursed from six to eight minutes on the first, and from five to seven on the second. Actual weighing times observed by myself on a month old baby weighing under 9 lb. were: 2 oz. in first 2 minutes; 1¾ oz. in second 2 minutes; ¾ oz. in third 2½ minutes; none in fourth 2 minutes. Other breast: 1¾ oz. in first 2 minutes; ¾ oz. in second 2 minutes. Total 7 oz. in 12 minutes.

It is interesting to note the slower rate for second breast due, presumably, to lessened desire for food. When breast-milk is failing try supplementary feeds after the mother's feeding in order to keep up stimulation by emptying the breasts. In the case of difficulty with an infant who will not take the bottle after the breast at first, he must be taught the use of the bottle if necessary when hungry, the milk of the mother being thoroughly expressed later, if necessary, by the hands or the pump.

FOSTER-MOTHERS.

That breast-milk from a foster-mother is the next best feed to mother's milk goes without saying. So in a hospital such as this Babies' Hospital the presence of nursing mothers is invaluable for the most sick infants. In the choice of a mother appearances are very deceptive. The most promising looking nurses in our experience have not proved to be the best. Observation of her supply is the only means of forming a judgment. Our best mother was a poor-looking specimen who has grown young-looking and well in hospital, and proved a very satisfactory foster-mother. Her baby is now 12 months old and she is still regularly giving us 31 oz. per day. It is, of course, essential that the mother should be carefully examined and her history and character known. We have, in this hospital, largely followed what seemed to me the exceedingly practical methods of Dr. Fritz Talbot, of Boston. Mothers are chosen carefully and examined by ordinary clinical methods, and blood tests are taken.

The mother brings her baby with her for three reasons: (1) it has first claim on its mother's milk (in New York the foster-mothers' children deprived of their mother's milk had a high mortality) and the child taken with the mother gets some mother's milk, mother's care, and supervision; (2) it keeps the mother happy and content, for she sees her baby does not suffer from her service to others, and she is earning her bread and still doing her duty to her own child; (3) the good condition of her child is some criterion of the value of her own milk.

The child has three feeds from its mother each day. The rest of the milk goes to the hospital. The mother does not, as a rule, suckle the foster children, lest by any chance any of our infants prove to be syphilitic. As has been shown, it is better, both for mother and child, where there is only one nursling and where mother and child are both healthy, that the mother should feed it naturally and directly on the breast. But in a hospital such as this the milk is very precious. We have found, time after time, that the substitution of one or two breast meals a day may make a difference in the progress of a very dyspeptic case where more milk cannot be spared. Experience shows that the psychological effect on English women of nursing several babies is to produce dislike, nausea, and a suppression of the milk. We therefore arrange for the milk to be drawn off. The whole arrangements for these women are in the hands of the sister who superintends the preparation of the feeds. She teaches the women to draw off the milk. They each have a tray with all the necessary implements which are kept scrupulously clean. They are taught to clean their hands. Special nursing overalls are supplied to them and their hygienic arrangements supervised. Their milk is tested from time to time. Their own health is carefully watched. Our mothers have been healthy and well the whole of the time.

[12] Arch. Pediat., N.Y., 1922, xxxix., 371–373.

We have had five mothers in the hospital since March 1st last year. At first the mothers were paid £1 a week, now they are paid 10*s.* a week. Each mother does domestic work in the hospital to the value, according to the matron's estimate, of 10*s.* a week. Each mother supplies from 27 to 31 oz. of milk per day besides the milk for her own child. According to Budin, the milk varies with the number of nurslings. Our mothers have been fairly constant in their supply, but that is because the number of nurslings has not varied. The full amount of milk available has been drawn off and distributed as required.

METHOD OF FEEDING.

It must be remembered that a much less quantity of breast-milk may be sufficient for a child's feed than if a cow's milk dilution feed were used. A premature child may need only eight ounces of breast-milk per day. A very delicate child may not be able to digest full human milk. Budin found this out and used to give pepsin powder to some of his infants before the meal. We have not done this, but we have frequently had occasion to dilute the milk, and have found that food tolerance can be over-balanced by a too high feed of breast-milk just as seriously as when giving a cow's milk feed. When the child is taking from the breast directly the feed can be limited and water given just before the feed or Budin's plan of the pepsin powders may be attempted. Before weaning is resorted to in cases where the breast-milk is said not to suit the digestion of the child and these methods have failed, the milk can be drawn off and diluted. Where dilution has taken place, and where it is obvious that more sugar can be tolerated, sugar of milk may be added in the proper proportions. Occasionally the feed has to be given by the spoon, pipette, or Breck feeder, and in some cases it is well to "gavage" some of the feeds each day to save expenditure of energy in a very delicate child. Gavaging is easy in the premature infant.

A Lecture
ON
TESTS FOR CURE OF GONORRHŒA IN WOMEN.

Delivered at the London Lock Hospital on Feb. 22nd, 1924,

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I AM constantly being asked by the patient, or her doctor, or someone interested in the work, how one knows when a woman is cured of gonorrhœa; and I have to confess that it is often a most difficult question to decide, because the two most sensitive testing media we know of are debarred us experimentally, although they are essential to an absolutely definite reply. These two media are the mucous membrane of the male urethra and the conjunctiva of the child. They will detect the gonococcus when every other test fails; and it is unfortunate, from our standpoint, that the reliability of all the other tests we apply are finally judged mainly on the reactions of these two media, for, when the question of cure arises in a young woman, we are really being asked: (1) If the woman resumes connexion will she, or will she not, infect a partner previously free from the disease? (2) If she becomes pregnant, is the child at birth exposed to the risk of gonococcal conjunctivitis?

In women past the child-bearing age only the first question matters; and even that is often of minor importance, for what usually then concerns her is that she should be assured that she will not suffer from any of the chronic sequelæ, urinary, genital, or metastatic, which are the consequences of inadequate or unsuccessful treatment.

CERTAINTY OF CURE WITH PROPER TREATMENT.

What are we to say to a woman in either of these categories, and what tests can we apply to help us to a definite decision? The belief, probably first enunciated by Noeggereth, that when a woman becomes infected with the gonococcus she never gets rid of it, has been accepted and supported by many gynæcologists since his time; but it is quite untrue. Women, properly treated, can recover completely from gonorrhœa without a trace of after-effect. The gynæcologist sees the failures, not the successes, and judges accordingly. His mental state is similar to that of the neurologist, who, seeing case after case of tabes or general paresis, and influenced by the continual drip suggestion, comes to the conclusion that syphilis is incurable.

Another factor that has helped to make the belief in the incurability of the disease in woman so prevalent is that, whilst men have had skilled treatment for gonorrhœa for many years, the treatment of women for this complaint has been largely in the hands of physicians who have had no special training in the work. Their methods of attacking the disease have, in consequence, been perfunctory in the extreme, and their standards of cure totally inadequate. In addition, there is the ever-present shadow of the prostitute, always stopping treatment as soon as obvious symptoms disappear, and invariably becoming reinfected, if by any chance she has ever been cured. Following her, in a lesser degree, is the average out-patient, continuing her ordinary sexual life all the time she is undergoing treatment, probably with the husband who gave her the disease, and who himself has never been cured. To those who have to handle patients of this description, pessimism is natural; it could hardly be otherwise. And most of the literature dealing with the subject, especially on the continent, is derived from this source.

In private practice, however, and in an institution like the Lock Hospital, where a patient can be segregated for months, things are vastly different. Given proper treatment a cure can be effected in average cases in some three to six months. In acute cases, seen from the start, one can often effect a cure in two months. Such results conduce to a reasonable optimism.

One of the pitfalls of practice is the habit of treating patients as if they lived self-contained lives. They do not. It is useless promising a wife permanent cure unless one is certain her husband is free from the disease. No stringency of test can overcome this difficulty, and recurrence after passing successfully all known tests is not necessarily due to failure of the tests. Nothing, obviously, can be promised if there is any sign of disease in the husband. These points, self-evident when pointed out, are not always remembered; and when a case will not clear up, or recurs after apparent cure, one should insist on examining the husband, if this has not already been done.

Remembering all these precautions, one may now proceed with a chastened optimism to consider what is an adequate standard of cure, one which will be sufficient for general use, and not too elaborate to defeat its own ends by setting up an ideal impossible to attain. Such tests will obviously depend upon: (1) clinical signs; (2) bacteriological results; and (3) possibly serological findings.

CLINICAL SIGNS.

The first criterion, then, is that all clinical signs of the disease must have disappeared. By this is meant: (1) That there is now no induration of Bartholin's glands, or sign of inflammation around their orifices; (2) that the urethra, similarly, appears normal on inspection externally, palpation through the vagina, and urethroscopic examination; (3) that the para-urethral crypts, especially Skene's tubules, show no inflammatory signs; (4) that the vaginal introitus is

normal in colour, with no inflamed tags or crypts around it, and that pain is not complained of when a speculum is passed; (5) that the cervix appears normal, the secretion clear, and no erosion is present; (6) that the uterus and tubes, on bimanual examination, are apparently free from disease; and (7) that the anal orifice seems normal, and there are no signs of inflammation or discharge in the anal canal on passing a speculum.

BACTERIOLOGICAL SIGNS.

The second essential desideratum is that all bacteriological signs of disease should be absent. Evidence on this point can only be accepted if the following technique, and the precautions mentioned below, are observed when making the examination:—

(1) Smears, taken from the urethra by means of a sterile platinum loop inserted half an inch down, should be negative for pus cells and gonococci in a patient who has had a provocative injection of 1 c.cm. gonococcal proteose 24 hours previously. The urethra should have been massaged gently forward before the loop is inserted, and the surgeon should have assured himself that the patient has not passed urine for some hours before examination. (2) The urine, held for some hours before examination, should be clear, acid, free from albumin, and contain no gonococci, or pus, when the centrifugalised deposit is examined under the microscope. (3) Smears taken from the orifices of Bartholin's glands and from Skene's tubules should be negative. (4) Smears taken from the cervix by means of a platinum loop should be negative, for gonococci and pus, when taken before menstruation, just after menstruation has ceased, and 24 hours after a provocative injection of 1 c.cm. gonococcal proteose. (5) Smears taken from the anal canal should be negative for the gonococcus. The anus is a fruitful source of reinfection. Gonococci can often be found there when they are absent elsewhere in women. Surgeons dealing with men only frequently forget this. Gonococcal infection of the anus and rectum in men is rarely seen, except at a hospital dealing with diseases of the rectum. I saw three cases in one year at the Gordon Hospital. It is very uncommon at the Lock Hospital in men. I have seen only one case there in the last five years. This, of course, is due to the fact that anal gonorrhœa in men is generally due to unnatural practices. In women, however, the cause is quite different; the disease is gravitational and, if looked for, it is surprising how often one finds it. When vulvitis is present, or when there is a history of recent vulvitis, it is the rule rather than the exception to find gonococci in the anal smear.

I have always been averse to the use of irritating applications of silver nitrate to the urethra at any time, especially when they are done to provoke discharge in the hopes of thereby finding the gonococcus. The method seems to me to savour of barbarism, and to be clinically unsound. Since the discovery of the value of a provocative injection of gonococcal proteose, or "residual" vaccine, it appears to be quite unjustifiable. In the cervix, however, the same objection cannot be maintained; and, if in doubt, or if a provocative dose of vaccine, or proteose, is not available or convenient, it may be used. It will be noted that I have said nothing about attempting to grow the gonococcus from smears in women. That is because I have been painfully impressed with the uselessness of the method. Time and again, in my experience, cultures have been negative for the gonococcus when smears have been positive, because organisms such as staphylococci grow so rapidly as to smother any gonococcal colonies which may be present. Anyone who trusts, therefore, in a negative cultural report alone, in a woman patient, is living in a fool's paradise. There is, of course, no objection to having cultures made in addition to smear examination, and in private practice it may often be advisable, as a positive report, when present, strengthens one's position. But in a large clinic, where thousands of examinations have to be made yearly, where all the facilities are available, where skill in growing the organism is at its maximum, the proportion of successful cultures is so small in women that to my mind it is a waste of a skilled pathologist's time to order them. I therefore never use cultural methods in women, except when examining for cystitis, pyelitis, or systemic infection. In men, however, cultural methods have much greater chances of success, and none of the above remarks refer to them.

SEROLOGICAL TEST.

To the clinician, anxious not to make a mistake that may have disastrously far-reaching effects, the theory of the complement-fixation test (C.F.T.) is intensely attractive, especially when his patient is a woman; for many of these patients are brought for examination having no idea what is suspected to be the matter with them—the word gonorrhœa is never mentioned. If such a simple procedure, therefore, were possible as taking a specimen of blood from the arm, sending it to a pathologist, and on his report being able to say definitely this is, or is not, a case of gonorrhœa, or this case is now clear of gonorrhœa, the surgeon concerned would be only too thankful to adopt it. Gone would be the careful and exhaustive physical examination, the instrumentation, the taking of smears from half a dozen places, at intervals spread over half a dozen months, the cautious prognosis, even then, if everything appears satisfactory. Gone would be all the worry and anxiety, both for the patient and her medical attendant. But, alas, it is not possible. The golden road to an easy prognosis is not yet. A patient may have a profuse gonococcal discharge, and yet give a negative C.F.T. for the first two or three months of the attack. On the other hand, a case may have cleared up completely, and yet the patient may give a positive C.F.T. when all infection is over. Even the advocates of the method admit this, as antibodies do not develop sufficiently rapidly in the early days of the disease to influence the reaction, and they persist for months after active disease has ceased, and so give a positive result. Theoretically, the test should become negative three months after infection has ceased. But does it? From observations I have made I very much doubt it. It seems quite unreliable if a patient has ever had a course of vaccines—a very great drawback in these days, when nearly every patient has had at least one course of vaccines at some stage of her disease. It may still be positive when a patient has resumed normal married life, had no signs of metastatic trouble, and given birth to a perfectly healthy child to a second husband who is himself free from the disease—a combination of circumstances not infrequent, on account of the re-marriage of war widows. I have known it positive four years after all symptoms had disappeared. That might mean, of course, that there was a hidden focus keeping up the supply of antibodies. If so, it was so hidden that for ordinary marital life it could be neglected; and in this particular case I asked myself the question: Was it fair to debar the patient from marriage simply on a positive C.F.T. with no other symptoms? I came to the conclusion it was not. Results have justified that conclusion.

VALUE OF THE COMPLEMENT-FIXATION TEST.

Personally, I was greatly attracted by the test at first, and commenced using it with a distinct bias in its favour. For over a year I tried it on every woman who came up to the out-patient department of the Lock Hospital, either for treatment or for a test of cure; and at the end of that time, on considering my results, I felt compelled to abandon it as a routine. Three conclusions, I think I may safely say, I was able to deduce from my experience:—

1. That, in the acute stage of a urogenital infection, the C.F.T. was useless as a means of differentiating between a gonococcal and a non-gonococcal infection. This, of course, only confirmed what was already known.

2. That, if a urogenital infection had existed from two to six months, then a negative C.F.T. indicated that the disease was non-gonococcal, and this would be confirmed by the bacteriological tests—in other words, the reaction is specific. This also agrees with previous findings.

3. That if a positive C.F.T. is present a year after all clinical and bacteriological symptoms have disappeared, it may be neglected for practical purposes. There may, of course, be some hidden focus tucked away somewhere which will perhaps produce a gonococcal iritis years later, but it is impracticable to debar a patient from marriage on that account. All clinical observers will, I think, agree with me here.

The truth, then, is that in the early stages of gonorrhœa the test is not sufficiently powerful to diagnose the disease, in the middle stages it will differentiate between gonococcal and non-gonococcal disease, and in the convalescent stage it is too delicate for use as a practical sign of cure.

SUMMARY.

I would say then, that, with the present technique, the complement-fixation test, as an indication of cure, if positive when all the other tests are negative, may be neglected, and one should rely for practical purposes on the two previous sets of tests, clinical and bacteriological. If these tests are negative, the patient should be asked to return in two months, and the tests repeated. If again satisfactory, the same procedure should be repeated in four months. If, at the end of six months without treatment, the patient still shows no sign of return, clinical or bacteriological, I think we may safely assume she is cured. A year later, if a repetition of the tests is negative, she can safely resume marital life.

That is the standard of cure at which I aim. It is not too high or too difficult to attain. It leaves, of course, a little element of uncertainty; but anything more, to my mind, would be an impossible ideal. If fresh manifestations show themselves after such a series of tests, either the method of testing is at fault or the patient has acquired a fresh infection. Before assuming the tests were inadequate one should remember that a moral twist cannot be cured by surgical means. A lot of the pessimism about the curability of gonorrhœa in woman is due to a failure to recognise this fact.

AUTO-HÆMO-THERAPY IN BACTERIAL INFECTIONS.[1]

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SOME six years ago I began an investigation into the therapeutic possibilities of the blood as a result of two phenomena observed in France during the war, and the following are preliminary notes upon it.

1. In the autumn of 1916, at a Base Hospital to which I was bacteriologist, a small epidemic of lobar pneumonia occurred. A pure culture of a pneumococcus was obtained from the blood in one of these cases, and a sensitised vaccine made by Besredka's method with anti-pneumococcal serum. The extraordinary response in every case of this small series of 10 or 12 convinced me that a specific remedy for pneumonia existed, and to obtain it two problems had to be solved: (*a*) The causal organism must be obtained quickly and with certainty, and (*b*) a rapid method of making an artificially sensitised vaccine must be found.

2. Hundreds of bacteriologists had been investigating the blood in trench fever. The results in all cases were negative, and no virus was grown or demonstrated in films. From this mass of negative work, however, two facts emerged: It was proved (*a*) that the blood transmitted the disease, and that the whole blood and various parts of the blood contained the causal virus; and (*b*) that the disease could be transmitted by the excreta of the body louse.

In view of these two established facts with regard to trench fever, one was forced to come to the conclusion that the blood contained the causal virus, and not only contained it, but must contain it in large numbers if the body louse could extract sufficient to transmit the disease. In the present communication I shall describe how coccoid-like structures can be produced from the blood in from 10 to 60 minutes, and how these emulsions can be utilised in the treatment and diagnosis of bacterial infections. The unit of blood taken is one drop from a fine hypodermic needle. The blood is collected with aseptic precautions from any convenient vein, usually in front of the elbow, an all-glass hypodermic syringe being used.

During the last few years the coccoid structures described have been produced from whole blood and washed cells in a variety of ways; but the following three media have been selected as the most suitable for routine work:—

1. Doubly distilled water containing 0·5 per cent. ammonium carbonate.
2. Peptone (Witte's or Fairchild's), 2 per cent.; sodium chloride, 0·5 per cent.; ammonium citrate, 0·05 per cent.; calcium citrate, 0·02 per cent.; distilled water.
3. Peptone, 2 per cent.; Lemco, 0·5 per cent.; ammonium citrate, 0·05 per cent.; tap water.

In preparing Nos. 2 and 3 the citrates are not added until the other constituents have been dissolved and steamed, and if the reaction of the peptone or broth is acid it should be made just neutral to litmus. Witte's peptone usually gives a neutral reaction, but Fairchild's is generally acid. The media are neutral citrated solutions, and are finally sterilised by steaming for half an hour on three consecutive days. The ammonium carbonate distilled water is sterilised by steaming for 10 to 15 minutes on three consecutive days, and should not be kept for more than two or three weeks as the salt appears to slowly dissociate. Medium 1 produces immediate and complete hæmolysis; 2 and 3 contain just sufficient salt to prevent hæmolysis. The quantity of medium taken per tube is about 3 to 6 c.cm., and one drop of blood from a hypodermic needle introduced. The tubes are then rotated gently to diffuse the blood in the medium and placed in a water-bath at 58°–60° C. In from 10 to 20 minutes the contents of the tubes become turbid, and a few minutes later milky. Films made of the emulsions show innumerable coccoid bodies of varying size, many arranged in pairs or short chains of four. In the citrated media these bodies are less discrete, and masses of them can usually be found at the edges of the film. Red cells in all stages of disintegration are also seen. These coccoid bodies do not stain readily with the basic dyes unless an acid mordant is first used, 5 per cent. tannic acid being the best. They are generally Gram-negative. They take up the pink with the Romanowski stains direct, but the blue after free use of tannic acid. Before describing the manipulation of the emulsions of these coccoid bodies to convert them into therapeutic agents, I must briefly describe the technique that I have used for making vaccines during the last four years.

Technique Used in Making Agglutinated Vaccine.

The emulsion of the organism is made in ordinary neutral bouillon, and may be made from either solid or liquid media; it is diluted down to one of about 2000 million organisms per c.cm., and is heated for about 10 minutes in a water-bath at 60° C. The essential point of this stage is to get the organisms as discrete as possible, and this is by no means easy with some of the streptococci and other organisms prevalent at the present time. About 4 c.cm. of this emulsion are then transferred to each of a number of large tubes containing about 25 c.cm. of sterile normal

[1] A paper read before the Midland Medical Society on Feb. 27th, 1924.

saline. The diluted emulsion is then heated for 10 minutes in the water-bath at 60° C., about two-thirds only of the emulsion being submerged in order to obtain effective mixing convection currents. One drop of 2 per cent. NaOH is then added to each tube, and the heating at 60° C. continued for another 10 minutes. Four or five drops of 2 per cent. NaOH are added to each tube, the Bunsen heating the water-bath removed, and each tube rotated to hasten the mixing of the caustic soda. Two drops of liquor ammoniæ fort. are added to each tube, which is rotated and replaced in the cooling bath. The diluted emulsion in the saline becomes slightly milky on the addition of the caustic soda, this increases on the addition of the ammonia, and in a few minutes the tube contents resemble in appearance a positive macroscopic agglutination. A white flocculent precipitate settles to the bottom of the tubes as the water-bath cools. The deposits are washed twice in sterile normal saline in a water-bath at 55°–60° C., and finally in 0·5 per cent. carbolic saline, from which the vaccine is diluted to the required strength and bottled in carbolic saline. A film made of this deposit shows the bacteria agglutinated to varying extents and lying in a homogeneous material. The bacteria are black or red according to their Gram reactions, and the matrix is stained light red.

Standardisation of Dose.

The number of organisms per c.cm. is estimated before the agglutinating process is applied, and 12 c.cm. of an emulsion containing 2000 million per c.cm. will give a total of 24,000 million in the final product. I aim at a standard strength in the vaccine of about 1000 million per c.cm., but if the technique is right a variation of a few hundred millions is immaterial. In my experience the correct dosage for any individual patient must be found by commencing on the small side and increasing the dose until a satisfactory response results. The dosage in the case of vaccines is even more elastic than in the case of drugs where a wide range is universally recognised. It is not within the scope of the present note to enter into details as to what may or may not happen during the preparation of an agglutinated vaccine as described; but if I give briefly a hypothetical explanation it may be easier for any bacteriologist who wishes to make vaccines by this method to do so. The bacteria should be regarded as being surrounded by a homogeneous material that we may call the bacterial matrix. This matrix consists of an outer toxic portion, which is a nitrogen containing fat or lipoid, and an inner portion which is protein.

The objects aimed at in the preparation of the vaccines are threefold: (1) The production of a discrete emulsion, so that each individual organism is completely exposed to constituents dissolved in the emulsifying fluid. (2) The removal of the lipoid by weak caustic soda which is a fat solvent and forms a soap. The temperature varies from 56°–64° C. for different organisms. (3) The precipitation of the protein element of the matrix by the addition of more soda and then ammonia. Before precipitation the bacterial protein should have become saturated with lime, taken up from the broth and saline constituting the diluting medium. The supernatant fluid is a toxic soapy solution, and the precipitate consists of clumped bacteria lying in a lime-protein structureless matrix. I do not put forward this explanation with any claim that it is what actually happens, but merely as an intelligent objective, and if the technique is carried out according to it the desired end-product will be obtained. The two most important factors are the production of a discrete emulsion and the using of a broth and saline with a suitable lime content. If the emulsion contains clumps of organisms, these will appear in the vaccine with toxic centres, which have neither had the lipoid removed nor the protein saturated with lime. The lime-content of the saline I shall deal with later.

In watching the clinical results following the use of vaccines which are supposed to produce no reactions three very definite facts can be observed: Such vaccines (1) may produce all the beneficial results without any of the preliminary unpleasant or dangerous disturbances or reactions; (2) may be apparently inert as regards any good or bad effects produced; and (3) may produce severe reactions. If the lipoid is imperfectly removed, the vaccine may produce a reaction, and owing to the larger doses given the reaction may be severe. Such a faulty vaccine also frequently leaves small hard nodules at the site of injection, the organisms not being absorbed readily, with consequent diminution in the evidence of beneficial effects. If the protein matrix does not contain sufficient lime the therapeutic response is slight or nil. The results appear to depend upon the efficiency of the technique under the two headings of (*a*) lipoid removal, (*b*) lime saturation.

The term "agglutinated vaccines" is used because (1) they may not be detoxicated, and in the present state of our knowledge of bacterial toxins this is a term which conveys very little to me; (2) I am not prepared to put forward evidence that they are identical with sensitised vaccines, though clinically their effect is indistinguishable; (3) they are, however, agglutinated as regards the physical grouping or clumping of the bacteria.

Dosage.

The general scheme of dosage is that applied in the administration of sensitised vaccines. Three doses of say 500, 1000, and 1500 million may be given on three consecutive days with subsequent 1000 or 1500 million doses at three to seven days' interval. In my experience there is no object in exceeding a dose of about 2000 million, as if this dose does not produce a very definite response, it means that either the vaccine preparation technique has been faulty or the clinical diagnosis is wrong as regards the response of the disease to vaccine-therapy alone. This conclusion, of course, assumes that the vaccine contains the causal organism of the disease. The further manipulation of the emulsions of coccoid bodies obtained from blood is carried out on the principles just described. I do not put forward any claim that these structures are microbic, but shall use the term agglutinated "hæmo-vaccine" merely as a convenient term to indicate that therapeutically they exert some anti-bacterial effect. I shall confine the description of the manipulation of coccoid bodies from the ammonium carbonate distilled water, as the procedure in the citrated media is more complicated and less easy to bring to a satisfctory end-point.

One drop of blood is allowed to fall into about 6 c.cm. of ammonium carbonate distilled water. A zone of hæmolysis will be seen extending about half way up the tube from the bulk of the drop of blood at the bottom of the tube. With a sterile pipette the upper 5½ c.cm. of the tube contents are removed to a large sterile tube. The emulsion thus obtained has a faint pink colour, and a portion of the drop of blood is left at the bottom of the original tube. I cannot enter into the reasons for this procedure here, but I have cause to believe that the upper portion of the hæmolysed zone is more effective than the whole blood The diluted blood thus obtained is placed in a water-bath at 58°–60° C. and left there till turbid, and films show coccoid bodies, as in Fig. 1. About 1 c.cm. of 0·02 per cent neutral citrated broth is then added and the tube replaced in the bath for two to three minutes. About 10 c.cm. of neutral broth are then added, and the emulsion again heated for a few minutes. To a series of large tubes of sterile normal saline 3–5 c.cm. of the coccoid emulsion are then added and the process continued, as in the description of the preparation of agglutinated vaccines. The lime-content of the saline should be such that a considerable amorphous deposit is precipitated when 3–4 drops of 2 per cent. NaOH are added to about 15 c.cm. and the tube heated for 10 minutes at 60° C. If there is too much lime present the addition of a trace of caustic soda produces immediate turbidity and precipitation before the lipoid has been removed.

If there is too little lime the end-product is more or less inert. The dosage of the "hæmo-vaccine" of coccoid bodies is estimated by comparison with naked-eye turbidity of agglutinated vaccines, and diluted to a turbidity roughly corresponding to 1000 million organisms per c.cm. The administration is carried out on the principles adopted with sensitised vaccines.

Before proceeding to a description of the therapeutic effects, I would warn bacteriologists not to use these coccoid emulsions lightly. The technique is not easy to describe concisely; but very severe reactions may follow the use of imperfectly manipulated emulsions. The most dangerous elements are whole, or imperfectly disintegrated red cells, and emulsions containing these acquire an increased toxicity after standing in the cold for a few days. I have always investigated any new departure by animal experiment, and faulty emulsions, as described, have proved fatal to rabbits.

Investigations of the Coccoid Structures Described.

These fall under the two headings of scientific and clinical. Time, assistance, and equipment for scientific investigation have been meagre and limited. As a result I am unable to approach this aspect of the phenomenon as my findings are distinctly disjointed and incomplete. From the clinical side, however, I have had a unique opportunity of observing the effects of therapeutic administration. As physician in charge of a special department of clinical bacteriology in a large hospital, I am responsible for: (1) Supervision of isolation of the causal organism, (2) supervision of preparation of the vaccine, (3) supervision of administration of the vaccine, (4) determination of what additional forms of treatment are indicated, and (5) diagnosis of the condition for which the vaccine is administered.

Under these conditions many of the shortcomings of bacteriology in its clinical applications are avoided. In common with other forms of treatment, the entire structure of vaccine-therapy is built on a clinical basis. In the great majority of cases where a vaccine is administered and the patient improves, one wonders whether the improvement has occurred because of the vaccine or in spite of it, and the results are useless as regards the forming of any opinion as to the efficacy of the remedy. In a minority of cases, however, certain conclusions can reasonably be deduced, and where the total number is large, the minority represents hundreds of instances giving some information. The following four groups of conditions allow of certain deductions being made: (A) Acute fevers which run a moderately constant course, pneumonia being outstandingly the most constant of these; (B) diseases secondary to an unlocated infective focus: (C) toxæmias secondary to a known unremovable focus of infection; and (D) toxæmias secondary to obscure, unlocated, surgical foci.

Group A.—In pneumonia there is an inflammatory focus in the lung from which bacterial toxins are passed into the general circulation, and the vaccine should provide antibodies to neutralise the toxin. In the case of a sensitised vaccine clinical evidence of this neutralisation should occur in six to eight hours after the administration of the vaccine. The evidence takes the form of improvement in the patient's general condition with a fall of temperature, pulse, and to some extent respiration rate. The clinical evidence also points strongly to the neutralisation being a quantitative one, analogous to the neutralisation of diphtheria toxin by antitoxin. In this disease we recognise that a severe case will probably require a larger dose of antitoxin than a milder one, and the antitoxin is repeated until the toxæmia is controlled. In an ordinary case of pneumonia treated with average doses of sensitised vaccine the response is as in Chart 1. where a drop of about two degrees of temperature occurs six to eight hours after the administration of the vaccine. After keeping down for about 12 hours the temperature tends to rise again until a second dose of vaccine produces another fall.

Where the vaccine and toxin correspond in this way the fall of temperature and pulse in steps is very striking. If, on the other hand, the pneumonia is extensive, and the dose of vaccine not increased no very definite changes on the chart are noticed beyond perhaps a few transitory falls six to ten hours after the vaccine. The clinical point noticed, however, is that under the circumstances the patient's general condition seems to be very satisfactory. If the pneumonia is not extensive and one large dose of vaccine is given, the latter will often apparently completely and finally dispose of the toxæmia. When this is brought about on, say, the second day of the disease, it is very remarkable to see the patient apparently quite well and sitting up in bed with a normal temperature and pulse, but with a portion of the lung solid and all the physical signs of pneumonia present.

What deductions can be made from these results? We know that occasionally pneumonia aborts in the initial stage, but it is very rare to get two or three consecutive cases doing so. If the results described occur in six consecutive cases, it is sufficient evidence to warrant further investigation into the nature of the remedy apparently responsible. As my experience in the treatment of pneumonia extends from tens to hundreds, I find it still more difficult to come to any other conclusion than that these "auto-hæmo-vaccines," showing coccoid-like structures, exert some definite anti-bacterial effect. There is, however, another way of obtaining information, and this test I consistently apply where the patient is in hospital under my own observation. The temperature has been lowered on, say, the fourth day of the disease by one or two doses of vaccine to 100, and the patient's general condition is good. The vaccine is then stopped and the course watched. One of two things happens: either the temperature runs on in a modified form for four or five days, and then suddenly drops about the ninth day, or the temperature and pulse slowly creep up again, but are at once controlled by another dose of vaccine. It is very difficult to explain these attenuated courses by any factor outside the "vaccine."

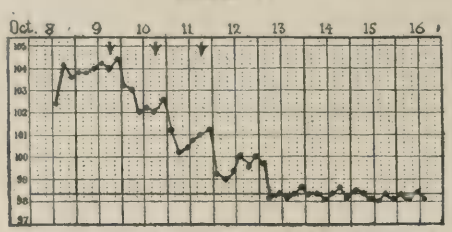
I do not claim for a moment that every case of pneumonia I have treated has responded as above described, but such a large percentage have done so that the principle appears to be sound. Where the response is not satisfactory also a reason can generally be found, and the chief causes of non-response are: (1) Faulty technique in preparation of the vaccine: As previously mentioned, I am quite sure that vaccines can be more or less inert though detoxicated if this term is to signify that they do not produce a reaction. A second vaccine made from the same emulsion, but with a different lime-saturating technique, may be just as effective as the first was inert. (2) Insufficient dosage: Three or four doses of, say, 500 million may have had no appreciable effect when a dose of 1500 million may at once control the disease. In these cases, however, it is difficult to estimate what the cumulative effect of the previous doses has been. (3) Faulty diagnosis: The entire mechanism of the above treatment of pneumonia rests upon a clinical basis, and the smallest empyema or metastatic abscess will completely negative results. The vaccine, however, is useful in diagnosis, and the exploration of an indefinite dull area because the patient failed to respond has yielded pus on several occasions, although the physical signs alone scarcely indicated pleural puncture.

When the pneumonia is associated with pleurisy, the response on the chart is usually less definite, and often occurs suddenly in three or four days. Finally, where the patient is moribund, and the myocardium and vaso-motor mechanism have already received a lethal dose of toxin, no neutralisation of the further supply will avert a fatal issue.

Group B.—In the second group of case I will give a typical example. A patient starts a course of "vaccine" for definite rheumatoid arthritis of two years' duration. The teeth appear sound, the arthritis has completely subsided in three months, and the "vaccine" is stopped. In six weeks there are

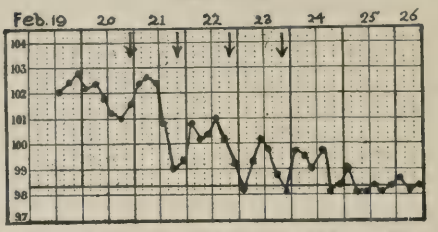
definite signs of relapse, the dental surgeon passes the teeth, and the arthritis again responds to the "vaccine," but again relapses in a few weeks. An X ray photograph then demonstrates the presence of an apical abscess. With the extraction of the tooth and a few doses of "vaccine" the arthritis disappears, and the patient is free from the disease two years later.

CHART 1.



Lobar pneumonia, October, 1916. Sensitised pneumococcal vaccine started on second day of disease. (Doses indicated by arrows.)

CHART 2.



Lobar pneumonia, February, 1923. Agglutinated "hæmo-vaccine" started on fourth day of disease.

Whatever the structures in the "hæmo-vaccine" may be, they would appear to exert a neutralising effect upon the toxins absorbed from the apical abscess.

Group C.—Chart 3 is that of a patient with severe phlegmasia alba dolens. The irregular septic temperature had been present for some weeks before starting the "hæmo-vaccine," which appears to definitely neutralise the absorption from the thrombosed vein for about 36 hours after each dose.

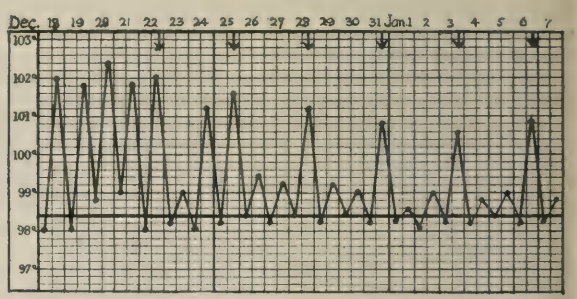
Group D.—In my experience of the use of "hæmo-vaccines" the most striking evidence of their antibacterial action has been in the lighting up of latent or obscure surgical foci. The action of a vaccine on an infective focus may take the form of a focal reaction or of a focal response. A focal reaction occurs where the vaccine used is one that produces a reaction and the disturbance is due to a temporary aggravation of the infective process. A focal response may follow the use of a sensitised vaccine, and is due to increased tension in a closed focus caused by antibacterial bodies entering the focus. If, for example, the corresponding sensitised vaccine is administered for a blind boil, one of two things will happen—either the boil will be absorbed and disappear, or it will rapidly come to a head and burst, and it is when the latter occurs in a closed space that signs and symptoms of response are evident. If the closed focus is situated in bone, or in a closed viscus such as the gall-bladder with obstruction in the duct, the addition of the serous exudate containing the antibodies results in increased tension, with consequent pain and evidence of increased toxæmia.

steps following the first three doses of vaccine, and the patient made an uninterrupted recovery. The intermediate condition between these two cases is where there is a focus present, but it is not under conditions where a slight increase in bulk will raise the tension. Examples are collections of pus such as an empyema and thrombosed veins in continuity with the blood-stream. In toxæmias secondary to this type of focus the vaccine has only a transitory beneficial effect or none at all. Although it exerts no localising effect, it indicates the presence of a focus which must be sought for on general clinical grounds.

The following two cases are examples of the localising effect:—

A boy had signs and symptoms of periostitis of the tibia, the periosteum was incised, and a small collection of pus exposed with apparently healthy subjacent bone. The temperature and pulse, however, remained up, and as there was a slight pleurisy present the origin of the toxæmia was obscure. In six to eight hours after the administration of a dose of "hæmo-vaccine" the boy developed excruciating pain in the tibia with a rise of temperature a few hours later.

CHART 3.

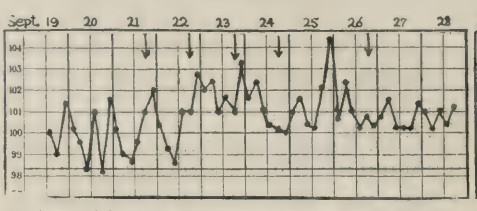


Puerperal white leg, December, 1919. "Auto-hæmo-vaccine" administered.

The bone was then opened and found to be infiltrated with pus.

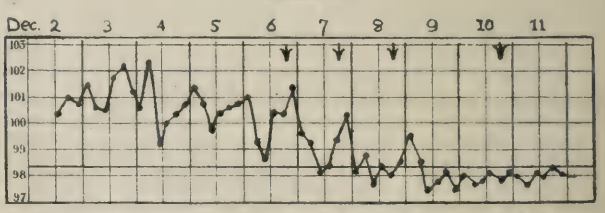
A woman, aged 29, for three weeks had been running an indefinite temperature with no localising signs or symptoms beyond a suspicion of jaundice at one time. A "vaccine" was administered with the object of possibly clearing up the infection, or more probably of localising the focus. On the

CHART 4.



Endocarditis with dental septic focus, September, 1922. "Auto-hæmo-vaccine" administered.

CHART 5.



Endocarditis without obvious focus, December, 1922. "Auto-hæmo-vaccine" administered.

The two Charts 4 and 5 are those of two cases of endocarditis. In Chart 4 there was an obviously septic tooth present. After the administration of the vaccine there was severe pain in the tooth, the swelling of the gum increased, the temperature rose and became continuous instead of intermittent, and the patient, who refused to have the tooth extracted, died. In Chart 5, clinically an identical case but with no obvious focus of infection, the temperature descended in three fourth day, after three doses, the patient had a rigor accompanied by severe pain and tenderness in the region of the gall-bladder. An immediate operation was performed, and the gall-bladder was found to be distended with sero-purulent fluid.

I could enumerate 30 or 40 examples of obscure surgical foci localised in this way. Whatever these "hæmo-vaccines" may contain from a scientific point of view, they are extremely useful in practical clinical

diagnosis, and can be prepared in less than two hours, if necessary in a portable apparatus at the patient's house. I have endeavoured to keep a very open mind on the clinical results, but in the four groups of cases described it is difficult to come to any conclusion other than that the agglutinated emulsions of these small coccoid-like structures exert an antibacterial effect.

Having described the methods of producing the coccoid bodies, their further manipulations, and the results of their administration in the form of agglutinated emulsions, one naturally asks the questions: (1) Where do they come from? (2) What are they? (3) How do they exert their bactericidal powers? These questions open up very difficult scientific problems, to which I am not prepared to reply. From the indefinite and incomplete investigations that I have made in that direction, I have come to the conclusion that in a small laboratory, staffed and equipped for routine work, it would take a life-time to answer the above questions with the requisite scientific evidence. They appear to originate from the red blood cells. So far as their morphological appearance goes, they might be fragments of red cell stroma, colloidal particles of protein, some kind of micro-organism, or some particles which at present are not recognised as definite entities. Their exact mode of action is equally obscure. They may act in a manner analogous to peptone or shock protein-therapy. On the other hand, they act without producing any shock or reaction, and the fact that these coccoid bodies can be produced in vitro in peptone or other proteins would rather suggest that therapeutic proteins act by producing some form of coccoid body in vivo. I have a certain amount of evidence that the structures exert their bactericidal power by acting as calcium vehicles; but beyond that I am not prepared to put forward suggestions.

Although I can claim so little from the scientific side, I have not the slightest doubt as to the clinical evidences of antibacterial action. The conditions described are those in which the evidence of this action is peculiarly striking. The entire clinical evidence, however, is based upon four years' experience with about 2000 cases. All varieties of bacterial infections have been dealt with, ranging from tuberculosis in the human being to distemper in the dog. I hope to describe in detail this form of treatment of many diseases in the near future.

In conclusion, when he masters the slight though numerous technical difficulties of the procedure described, I am sure that the clinical bacteriologist will find at his disposal a rapid and most effective antibacterial remedy. Also I hope that the research laboratories will find data to investigate in the scientific problems that are involved.

ANTHELMINTIC WORK IN EGYPT.

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IN a previous communication[1] I described the establishment of a special department, termed an anthelmintic annexe, at Kasr-el-Aini Hospital, Cairo, for the out-patient treatment of the worm infections that are so rife in Egypt. The success of this undertaking has led to a large development of the system, so that at present there are five other annexes at work in the larger towns, one of which is supported by local funds. The object of the present article is to describe in brief outline the clinical work done and the results of further experience; an official report with statistics is in course of preparation by the Public Health Department.

Where space permits the annexe is erected in the grounds of a general hospital, but always has a separate establishment under the charge of one or generally two special medical officers. Each annexe consists of marquee tents or light shelters, arranged as waiting rooms, latrines, treatment room, clinical laboratory and shelters in which patients rest after treatment; accommodation for women and children is kept distinct. The shelters occupy the greater part of the annexe and are furnished with stretchers on trestles.

The patients are either sent from the neighbouring hospital or come of their own accord. The popularity of treatment is shown by the large and increasing attendance; over 50,000 new patients came last year, the largest annexe taking more than 10,000. Of these some 10 to 15 per cent. are females, and about 15 per cent. are children under 12 of both sexes. Males largely predominate, since they are more exposed to repeated infection. On admittance the general condition of the patient is noted and specimens of the dejecta secured for microscopical examination. When definite anæmia is present (easily determined by the use of Tallquist's card hæmoglobinometer), the patient is at once given a dose of vermicide, provided the alimentary conditions are favourable for its action. Otherwise he is directed to return for treatment, the next day if possible. At the second visit the results of the microscopical examination is known and appropriate treatment instituted. Negative cases and patients unsuitable for out-patient treatment are thus eliminated. Of the positive cases the great majority are infected with bilharziasis or ankylostomiasis.

Bilharzial Cases.

Treatment.—The routine treatment is a course of intravenous injections of antimony sodium tartrate, given three times a week till 12 doses have been given; this occupies four weeks. For an adult man the maximum dose is usually 2 gr., which is attained at the third injection; the initial dose is 1 gr. and the ordinary full course totals 22½ gr. of the drug. For women and adolescents smaller doses are often advisable, usually 1½ gr.; for children under 10 years 1 gr. is generally a sufficient dose. After each injection the patient lies down for an hour or two in the shelters, and is warned to avoid exertion for the rest of the day.

Control.—The effect of the treatment is tested by a routine microscopical examination of the excreta on the day when the eleventh injection is given, some 24 days after the commencement of treatment. Sometimes no ova are to be found, generally a few, occasionally some hundreds. These ova should all be unmistakably dead, showing up black or brown under the microscope, and in such cases the next injection (the twelfth) will complete the course. Only a small proportion of patients, 2 to 4 per cent., show a few ova yet alive and require more than 12 injections to ensure a cure. I have only met with one case in which the ordinary course had little apparent effect on the ova; a shorter course is often sufficient to cure slight cases, especially of old standing. In the case of patients, such as children, who are given reduced doses, it is advisable to test the efficacy of the dose employed earlier. After a fortnight's course, from 25 to 50 per cent. of the ova should fail to hatch in water.

Results.—While all observers agree on the beneficial results of antimony treatment, some report failure in a considerable proportion of cases. But before discussing the causes of failure it is necessary to distinguish between the clinical and the vermicidal results. Thus in many instances a few injections will remove the symptoms, while a prolonged course, amply sufficient to kill the ova and parent worms, will not cure a patient whose symptoms are due to secondary infection or papillomatous growths. The only criterion of specific cure of bilharziasis is the permanent disappearance of living ova; for months afterwards some dead ova may be found. The mere cessation of hæmorrhage is worthless as a test; in untreated cases there is often no blood lost, and a clear-looking sample of urine will often be found to contain far more ova than a specimen showing profuse hæmaturia.

Causes of Failure.—Judged on the vermicidal result, the usual cause of failure is insufficient treatment. This is commonly due to the early relief of symptoms, so that the patient, deeming himself the best observer, ceases attendance after a week or two.

On re-examination some months later, little or no effect of the treatment may be found. In the annexes it is to be expected that a considerable proportion, often more than half, of the patients fail to take a full course. Much depends on the punctuality and personality of the medical officers, and it is a compliment to Dr. Yassa Mitgalli, who has charge of the Kasr-el-Aini annexe, that over 63 per cent. of his bilharzial patients took the full course. Irregular attendance of patients is often responsible for unsatisfactory results. Should a patient absent himself for a week or two after a short course of four to six injections examination of the urine on his return will generally show absence of living ova. But this short course is rarely lethal to the parent worms, as we have been able to prove by post-mortem examination, so that a cure can only be assured by further treatment.

The following case is an example of failure due to infrequent attendance :—

Time in weeks	1	2	3	4	5	6	7	8	9	10
No. of injections per week ..	3	1	1	2	0	3	1	1	0	3

Here 15 injections, totalling 28½ gr. of antimony tartrate, were given in the course of ten weeks. At the finish three dead ova were found in the sample specimen ; five weeks later three living and 25 dead ova. Five months from the end of treatment 200 living ova were counted in the specimen passed. Experience proves that it is necessary to maintain a sufficient concentration of the drug in the circulation for three to four weeks to secure death of the worms. When reduced doses are given it is advisable to test their effect on the ova during treatment, as mentioned above. Should a patient exhibit some intolerance to antimony, the dose can safely be reduced with little risk of jeopardising the cure. In such cases it appears that the system is saturated, and the worms suffer more than their host.

Clinical Results.—The clinical results of specific treatment are excellent in the early stages, but cases complicated by severe sepsis or marked structural changes are little benefited. A few very early cases with initial fever, œdema of the legs, swelling of the liver and spleen with high eosinophilia have come into hospital, and it has been possible to watch the rapid regression of these signs on treatment with antimony.

Bladder.—These cases form the great majority and do very well unless much pyuria from bacterial infection be present.

Ureter.—On account of the small calibre of the ureters, bilharzial disease readily produces partial obstruction and the late effects are disastrous.[2] Any case of renal colic showing even the slightest signs of bilharziasis should receive specific treatment, as only the earliest stage is curable.

Intestine.—Cases suitable for out-patient treatment do well. Those complicated by pellagra, septic dysentery, extensive papillomatous growths, or infiltrations are admitted to the wards, but are often refractory to all forms of treatment.

Liver.—Bilharzial cirrhosis is by no means an uncommon complication of *B. Mansoni* infection. In its later stages little benefit accrues from specific treatment : when the general infection has been treated, splenectomy is advisable if the enlarged spleen causes much local discomfort.

Precautions.—To avoid undue risks, proper selection of cases is indispensable. The more obviously unfit are automatically excluded, since they are unable to make the journeys to and from the annexe. Routine examination of the urine detects cases of renal disease, usually pyonephrosis from ureteral obstruction. Anæmic patients are first examined and treated for ankylostomiasis before treatment for bilharzial disease is instituted. Some deaths of apparently healthy persons under treatment with antimony have occurred. Reports indicate that intercurrent disease, especially attacks of fever, is an important source of danger. Unexpected bouts of pyrexia are not uncommon among our patients of the lower classes, but are rarely the subject of complaint. Thus an out-patient may come for his injection when suffering from influenza or other malady, conditions which render the use of antimony most undesirable. In other cases signs of cardiac irritation or depression may appear as toxic symptoms. Unless fresh solutions are employed, bacterial contamination may cause a considerable rise of temperature after injection. The precautions are : to use only fresh solutions, to feel the pulse, and to inquire after the general condition of every patient before each injection, taking the temperature should suspicion arise. After the injections have been given, the medical officer makes a round of the shelters and examines any patient who shows bad after-effects. A note is made on his card for subsequent warning. A certain number of patients develop jaundice ; this is infrequent—less than 1 in 1000. The jaundice may appear during the course, but more often a week or so later. It closely resembles the salvarsan variety and has been of a mild nature.

Treatment with Emetine.—It appears that previous to Christopherson's publication on the use of antimony[3] the beneficial action of emetine on bilharziasis was known in Cairo, and the drug used as a secret remedy. The high cost of emetine has militated against its routine employment for the thousands of cases treated annually in the annexes, but for certain patients it is invaluable, and the drug is preferred to antimony by some practitioners. We use emetine for the following classes of patients : (1) young children and others whose veins are too small or inconspicuous for intravenous medication ; (2) cases of intestinal bilharziasis complicated by amœbiasis ; (3) patients exhibiting intolerance to antimony ; (4) in the wards for cases complicated by advanced hepatic or renal disease. In general the course and doses employed have been similar to those of antimony tartrate. Slightly larger doses may be used, but are usually provocative of toxic effects, the patients complaining of heaviness and numbness of their limbs, symptoms which are not infrequent with the smaller doses towards the end of the course. An intensive course of daily injections in ten doses of 1½ to 2 gr. has been used by Erian[4] and Tsykalas[5] with success. On trial of this method Dr. Mitgalli found that severe toxic symptoms occurred in most patients, the neuritis being followed by ulcerations of the lips and tongue in several cases. At the end of this intensive course living ova were still found in the urine, but disappeared later. Patients seen after an interval of five months have shown a complete cure, proving that emetine has a cumulative effect and kills the worms as soon as the ova. With antimony, on the other hand, a short course will kill the ova in a similar way, but not all the worms. In the important work of Fargher and Gray[6] on the chemotherapy of antimony, it is shown that potassium antimony tartrate is two and a half times as toxic and the sodium compound one and three-quarters times as toxic as the lithium compound, whereas the antimony content is much the same in each. The drugs were tested by intravenous injection on mice. I have recently tried the effect of the lithium antimony tartrate, kindly prepared by W. M. Colles, Professor of Physical Chemistry at the Medical School. This compound proved to be fully effective in the treatment of bilharziasis, but it is too early to say that it is less toxic to man than the salts usually employed.

Ankylostoma Cases.

About 40 per cent. of the patients belong to this category, the proportion varying at the different establishments. Patients suffering from anæmia, both new and old, are seen first, as each treatment takes a few hours. The doctor counts the pulse, takes a drop of blood on absorbent paper, and enters its hæmoglobin value (according to Tallquist's scale) on the treatment card. Should the anæmia be severe or the general condition unsatisfactory, the patient is urged to enter the general hospital. In ordinary cases the medical officer directs that an anthelmintic be given at once, unless a meal has been recently taken, without waiting for a report on the dejecta. This is done to save time, for it is found that ankylostoma

patients as a class are irregular and slack in attendance. As the great majority of the patients have intestinal parasites of one sort or another a single treatment is of value.

Laboratory Diagnosis.—Though severe anæmia is almost invariably due to ankylostomiasis in Egypt, the identification of the infection by microscopical examination of the stools is always desirable and is necessary for the control of treatment. In the majority of cases the test is needed to confirm the clinical diagnosis, while in an important minority it shows some other infection—such as chronic dysentery—to be responsible for the patient's symptoms. For unless diarrhœa be excessive or hæmorrhage occur, the average patient pays scant attention to his stools. The specimens of fæces collected are divided for examination in two classes: (*a*) liquid stools and those containing blood, (*b*) those of normal appearance.

(*a*) Abnormal stools should be the first examined at the laboratory. The presence of blood and mucus more or less separate from the main dejecta is characteristic of bilharzial disease of the intestine, and the spined ova will be found in this exudate. Other stools may contain much pus, often many flagellates, and the origin of the dysentery be thus obscured by secondary infections. Suspicious stools must be searched for amœbæ; hence the advisability of examining such specimens as soon as possible, before the amœbæ become inactive. Cysts are much more troublesome to identify, and, in the case of *Entamœba histolytica*, need the addition of iodine solution to bring out their structure.

(*b*) In the ordinary stool the search for ova is simplified by the routine employment of the flotation method, the mechanical process being performed by an orderly. Although the very simple method used[1] is by no means perfect[7] it represents a great advance on a direct smear. All laboratory findings are entered in the space provided on the treatment card and the numbers of ova present roughly indicated by the addition of + signs.

Treatment.—Carbon tetrachloride is the best remedy and is given in doses of 3 to 5 c.cm., followed by a purge after two hours. As a rule two treatments will remove almost all the worms. When this drug is not available, oil of chenopodium is substituted; it is given in gelatin capsules, each containing 0·5 c.cm. To an adult two capsules are given at once; the patient lies down and after one and a half hours another capsule is administered, followed by a dose of castor oil after another hour. When the treatment is finished the patient is allowed to take food and go home. He is instructed to return a week later, fasting, and to bring a bottle for medicine with him. For the convenience of patients who live some distance away, sleeping accommodation is provided, so that they may come the evening before. In cases proved positive on stool examination, the anthelmintic is repeated on two subsequent visits, the patient taking iron and arsenic mixture or pills in the intervals. At the third administration the hæmoglobin value of the blood is again determined and the stools re-examined for ova. So long as ova are found, weekly treatments are continued. As a rule two treatments with carbon tetrachloride or three with oil of chenopodium are sufficient to expel all but a negligible number of the ankylostomes. Hæmatinic treatment is generally essential for a satisfactory recovery from the anæmia. The conclusions given in a previous study[8] have been fully confirmed on further experience. Thus the steady rise of Hb value following the expulsion of worms is an excellent index of successful treatment. The patient should be urged to continue taking the iron mixture and warned that recovery of his strength will be gradual. In many cases a weekly injection of sodium cacodylate will further improve the anæmia and encourage attendance, as most patients have a firm belief in the efficacy of the "needle." A failure of the case to respond to efficient treatment is a sign of an incomplete diagnosis, and some complicating disease should be searched for. When ascaris or tænia ova are found on examination of the stool, it is customary to supplement the treatment described by giving the appropriate remedies. Patients found suffering from chronic amœbic or bilharzial dysentery receive treatment at the annexe; negative cases are referred to the general hospital.

In concluding this brief survey I wish to express my obligations to the staff of the Public Health Department, whose work has been crowned by so large a measure of success.

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Clinical and Laboratory Notes.

A CASE OF *B. PYOCYANEUS* INFECTION CURED BY VACCINE TREATMENT.

BY H. RONALD CARTER, M.D. BRUX., M.R.C.S. ENG.,
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THIS case of *B. pyocyaneus* infection, which had some clinical resemblance to glanders, is of interest in that *B. pyocyaneus* usually infects the alimentary tract.

A married woman, aged 63, had been a cripple from rheumatoid arthritis for 20 years. The pyocyaneus infection had no connexion with her arthritis. On Oct. 5th, 1920, whilst being pushed along in her wheeled chair she suddenly felt that she had a "cold in the head." When she got home her nose was "very stuffy," and the next day she had developed a "feverish cold," which persisted and got worse.

Condition on Examination.—I saw her on the 15th, when there was a clear mucous discharge from the nose, sometimes blood-stained. Temperature 102° F. I could find nothing else to account for the temperature. The nose was douched with a saline lotion, and this often brought away large blood-clots from the posterior nares. There was considerable pain and swelling in the nose accompanied by frontal headache.

On the 28th a tense, brawny swelling occurred over the right parotid, with intense pain. I made a free incision and clear fluid escaped, which in a day or two became greenish in appearance. As the patient was in great pain I gave her a hypodermic injection of morphia in her left forearm; the next day the same brawny swelling appeared over the whole of the extensor aspect of the left forearm.

Operation.—I asked Mr. Zachary Cope to see the case, and he cut into the swelling and found no pus, but a complete necrosis of the subcutaneous tissue, which he proceeded to remove. About a week after this operation a greenish discharge made its appearance. The wound healed up in two months, when suddenly she developed acute pain and discharge from both ears.

Vaccine Treatment.—The patient was becoming rapidly worse, so I asked Dr. John Freeman to see her; he admitted that the case bore some clinical resemblance to glanders, but fortunately he was able to isolate the *B. pyocyaneus*, and glanders was not present. An autogenous vaccine was made, and I began giving a dose of 2 millions, but this proved to be far too strong. The vaccine had to be considerably diluted, and I found I got the best results with a dose of about 15,000. This small dose had to be cautiously increased, as any overdose made the patient very ill for a week. I continued to give the vaccine for two and a half years; latterly I was giving 100 million doses without producing any reaction. These large doses were well tolerated if given not oftener than once a month. The patient is now perfectly well; her arthritis, of course, remains the same.

I feel a case like this is convincing as to the adequacy of vaccine treatment. The question of dosage, however, is of practical importance, because on several occasions I had the greatest difficulty in persuading the patient and the rest of the family to continue the treatment after a very violent reaction had occurred. The laboratory expert cannot unfortunately tell us what the minimum dose in a particular case should be; the clinician must find this out for himself.

Kensington, W.

A CASE OF FOOT-AND-MOUTH DISEASE.

BY A. HUGH GIBBON, M.D. BRUX.,
LATE MEDICAL OFFICER OF HEALTH, BURY ST. EDMUNDS.

I WILL preface this note of a case of foot-and-mouth disease with the definition given by Prof. J. McFadyean, in Clifford Allbutt's "System of Medicine." "Foot-and-mouth disease is an acute febrile condition characterised by the formation of a vesicular eruption, the most constant seats of which are the buccal mucous membrane and the skin of the digits."

The patient, aged 35, was a tailor by trade. The attack occurred some years ago during a severe outbreak of foot-and-mouth disease in Norfolk. The patient had many farmers as clients and possibly became infected on his wrist while handling some client's clothes with saliva on them. The condition first appeared as a herpetiform eruption on lips, which gradually spread to buccal and lingual mucous membrane.

Foot-and-Mouth Disease.

FIG. 1. FIG. 2.

Showing vesicles on hands and feet of patient. Fig. 2 is a clearer representation of the condition.

Within from 24 to 48 hours bright red spots appeared on hands, arms, feet, and legs (Figs. 1 and 2), principally on the extensor surfaces, as far as the elbows and knees—though there were a few scattered ones on the soles of the feet and on the thighs. These gradually enlarged, becoming vesicular. Simultaneously, large vesicles developed all over the inside of the mouth, cheeks, and lips, and must have spread over the pharynx, as there was considerable difficulty in swallowing. The tongue, the whole surface of which was covered, had eight or nine large separate vesicles on it, the margins of which must have met, so that after these had subsided definite scars were left where the edges had been.

Simultaneously, conjunctivitis appeared (with much photophobia) developing into an acute purulent ophthalmia. There was also a purulent, very offensive nasal discharge. There was an increased salivary secretion, or an appearance of the latter, which might have been due to the difficulty in swallowing. The temperature rose slowly and steadily to 103° F. with very slight morning remissions, and as gradually subsided.

The patient's chief complaint, apart from the discomfort of the eyes and mouth and tenderness of the extremities, was that "he could not smoke, as it made his eyes and tongue smart too much." He "did not feel ill in himself." The total duration of the attack was about three weeks. The fluid in the vesicles was gradually absorbed, only one on the right wrist showing any signs of suppuration, while those in the mouth burst, leaving a bright red, very tender base.

The patient made an uninterrupted recovery, the only complications being that as the nails grew up there was a deep sulcus, showing symmetrical destruction of the matrix at the base of the nails, both of hands and feet; also—two years after the attack, when patient was last seen—there persisted a very definite, fine, fibrillary tremor of the fingers, similar to that seen in Graves's disease.

A CASE OF CHORION-EPITHELIOMA.[1]

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THIS case of chorion-epithelioma is of interest as it presents several unusual features.

The patient, a woman aged 35, had been married three years, and had had no child. She had lived in India for three and a half years before returning to England in November, 1923. Following are the details of the case before her departure from India:—

History.—She had always had slight irregularity of her periods, which were occasionally very painful; about nine months before marriage she began to have periods every three weeks. The periods at the time of marriage remained unchanged until August, 1922, when they began to be rather more frequent. About Christmas of that year the patient began to have bleeding every ten days followed by a pinkish discharge, which went on until the next bleeding in ten days or so. In about the middle of April, 1923, one night the patient suddenly had a very severe pain in the lower abdomen; she nearly fainted, and had to take brandy and have hot-water bottles applied. Next day she had rather severe vaginal bleeding. About ten days later she had a bad hæmorrhage that lasted a few hours. She was away from home April 29th to May 3rd, and had attacks of pain in the lower abdomen of increasing intensity, with vaginal bleeding during that time. On her return on May 4th marked tenderness of lower abdomen was detected, and by vaginal examination ill-defined masses could be felt on both sides of the uterus, which were very tender. The uterus could not be outlined; there was no mass in the pouch of Douglas; the temperature was 100° F.

Diagnosis.—As the patient had had cystitis some months previously a diagnosis of salpingitis was made. She was treated by rest in bed and hot douches, ichthyol and glycerine plugs and application to the abdomen for a few days with some improvement, but on the 9th the patient looked ill and could not move on account of intense pain at the lower abdomen. At this time there seemed to be less swelling to the left, but on the right the tender mass reached up to the level of the umbilicus; there was a leucocytosis of 15,000.

Operation.—Colonel G. D. Franklin was called in, diagnosed appendix abscess, and operated on the 10th. When the peritoneal cavity was opened the swelling was found to be due to blood, not pus; the incision was elongated, and a large left tubal gestation, still bleeding, was brought up into the wound. The mass was ligatured off with part of the ovary, and clots removed from the peritoneal cavity; it appeared to consist of nothing but laminated clots with the appendages. The uterus was found slightly enlarged. The abdomen was closed in the usual way. The patient

[1] A case described at a meeting of the Section of Obstetrics and Gynæcology of the Royal Society of Medicine, on Feb. 7th, 1924.

was relieved of all pain and made a rapid uneventful recovery.

Course of Case.—On June 7th, one month after operation, a vaginal examination was made; a fleshy mass in which a spicule of bone could be felt was found protruding through the os, which was about 1 inch dilated. The patient then said that for a few days she had felt pain in defæcation and had always to sit down very gently. The next day—under morphia—the mass was removed by ovum forceps and flushing curette; the uterus was gently curetted, and seemed to be empty and not more enlarged than in a two months' pregnancy. The fornices were clear. The mass removed was about 3 inches in length, and contained a few definite spicules of bone, but nothing could be recognised as any definite part of a fœtus. It was thought that the pregnancy must have been in the uterine end of the tube and expelled into the uterus where the fleshy mole had formed.

The patient was able to go to the Hills six days later, and there she picked up rapidly, put on flesh, and felt very well. Her periods occurred on June 27th, July 21st, and August 16th; they were increasingly painful, but there was no excessive loss. The August period started normally, but after the first day the discharge became watery and pink in colour, and persisted until Sept. 2nd, when she was examined again and a smooth round mass was found protruding from the external os. Four days later, under an anæsthetic, the mass was found to be the size of a goose's egg and attached to the anterior left wall of the uterus by a pedicle about 1 inch in diameter. The pedicle was divided, and a rough area left at its site of attachment, but otherwise the uterus was empty and the wall normal. Pure carbolic was applied; later the patient was given ergot and hot douches, and the uterus contracted down.

It was thought that this tumour was probably a chorion-epithelioma, and it was sent to Bombay for examination by a pathologist. He reported that the mass had a structure resembling placenta; no malignant change could be found, and there was nothing suggesting deciduoma malignum. The patient was up six days after this operation apparently well, but two days later, on Sept. 14th, she had severe pain in the left side of the abdomen low down; this persisted until the 20th, when she was again seen by Dr. Helen M. McMillan, who found tenderness in the pelvis; there were also diarrhœa and pelvic pain. During the next 24 hours there were four stools, which contained blood and mucus. Emetin and sodium sulphate were given, and all bowel symptoms quickly disappeared, but the uterus and surrounding parts were very tender.

On Oct. 9th, just before patient went to Bombay to sail for England, it was noted that her temperature varied between 99°–100°; she had some indigestion, and at times had pain on defæcation. The uterus was somewhat enlarged and still rather tender, a hard ridge was felt between the uterus and the stump of the left appendages; the stump itself was very distinctly felt. The right fornix and Douglas's pouch were clear. On the 13th profuse vaginal bleeding started, lasted for three days, and was followed by a pink discharge. During the voyage from India this discharge continued, the temperature ranged from 99°–100°, the pain in the lower abdomen was continuous and very severe, and there was added to it very acute pain low down in the back.

Condition on Arrival in England.—On arrival in London on Nov. 6th a hard, fixed nodular mass was felt in the abdomen, reaching up to the umbilicus and out on each side to the anterior superior spines. There was no dullness in the flanks and no evidence of any involvement of the lungs. There was very great frequency of micturition. On vaginal examination a large polypoid mass was found occupying the vagina. The lip of the cervix could be reached surrounding the pedicle except on the left side.

Final Operation.—On Nov. 8th I examined the patient under an anæsthetic, when the complete ring of cervix was felt, but the pedicle seemed to be attached very low down on the left side. I removed the polyp and gently curetted the cervix; it was then clear that the abdominal mass was fixed. A circular rough area about 1 inch in diameter was seen where the stalk of the polyp had been divided. This area reached to within about ¼ inch of the external os on the left side, and the opening of the undilated part of the cervical canal could be seen to the right of it. Into this the sound could be passed 2 inches. In the recto-vaginal septum a circular thickening about 1 inch in diameter and ¼ inch in thickness was felt separated from the cervix by about ½ inch of apparently healthy vaginal wall.

Fatal Termination.—After this operation the patient lived for three weeks; she got rapidly thinner, but the frequency of the micturition ceased, and there was no vaginal bleeding or discharge. Eleven days before death complete intestinal obstruction developed, which caused great distension of the upper part of the abdomen, but no increase of the tumour or change in the other signs in the abdomen could be detected. For the last five days there was suppression of the urine. The abdominal distension caused great embarrassment of respiration, but there was no other evidence of involvement of the lungs. The patient died on Nov. 28th of what the nurse described as suffocation.

The polypoid tumour removed from the vagina is roughly heart-shaped and measures 3 by 2¾ by 2 inches. It is a solid tumour with partly gangrenous exterior. The cut surface shows a narrow border of reddish tissue on the outside which surrounds a large firm pale area extending to the lowest limit of the mass. Two cysts are present in the mass, and a large hæmorrhage. There is some calcification in the pale area.

Dr. L. S. Dudgeon, who examined the tumour for me, found chorion-epithelioma in all the sections. He reported that there were wide tracts of necrosis and hæmorrhage; inflammatory reaction in the necrotic areas, especially at the limiting zones. One portion shows a firm fibrous tissue enclosing large cells, in some cases multi-nucleated, and a loose tissue with large multi-nucleated cells scattered all through. Two or three tracts of "epithelial" tissue are present in most of the sections.

The points of especial interest in the case seemed to me to be: (1) That the chorion-epithelioma followed an extra-uterine gestation, but appeared as an intra-uterine growth; (2) that three large polypi were removed per vaginam from the uterus between June and December, and in each case the area of attachment to the wall was of about the same extent; (3) that the periods returned, and were regular and not excessive between the removal of the first and second polypi; (4) that what appeared to be spicules of bone were found in the first, and calcified areas in the third polypus; (5) that there was no evidence of ascites, though the main mass of growth seemed to be intraperitoneal.

I am indebted to Dr. McMillan and Colonel Franklin for the details of the case before the patient's departure from India.

A CASE OF TRISMUS IN ENTERIC FEVER.

BY JAMES S. ANDERSON, M.D. ABERD., D.P.H.,
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IN view of the rarity of the condition, the following case has been thought worthy of record.

A male, aged 17, came of a family with a marked history of mental instability on the mother's side. He was admitted to hospital on the third day of his illness, having contracted the disease from his sister who had already sickened of it. The onset was acute, with marked prostration. For the next fortnight the temperature remained continuously between 101° and 105° F., the pulse-rate varying between 110 and 124. The blood gave a pure culture of *B. typhosus*, and an agglutination of the same organism to 1 in 30. On the seventh day of the disease low muttering delirium set in, while carphology and subsultus tendinum were invariably present. Hydrotherapy, with ice cold water, only partially controlled the fever, and sleep, usually of short duration, could only be obtained by intensive administration of chloral hydrate and ammonium bromide. For five days the delirium was very marked, and then gradually disappeared. On the twenty-third day delirium of suspicion was noted, but only for one day. Bowel hæmorrhage occurred between the fifteenth and twenty-first days, intermittent in character, and never amounting to more than a few clots. On the twenty-seventh day symptoms of periostitis developed in an unusual position—the right wing of the sacrum being involved. The temperature, which had almost reached normal, simultaneously began to rise. This region was explored on the thirty-third day, and from the pus a pure culture of *B. typhosus* was also obtained. Meanwhile, on the thirtieth day, trismus appeared. Tonic, apparently painless, contraction of the jaw muscles gradually increased in intensity, and was accompanied by difficulty in deglutition and tonic contraction of the extremities, and of the muscles of the back and the nape of the neck. The trismus was constant, and at most the teeth could only be separated to the extent of a quarter of an inch, but there were no convulsions typical of tetanus. In view of the possibility of meningitis, lumbar puncture was performed on the thirty-first day, when a slight increase of pressure of the cerebro-spinal fluid was noted. The cytology and chemistry of the fluid were normal, while the culture

remained sterile. Prior to the development of trismus no broken sores were visible on the body, and no history of recent injury was present. No urinary changes were detected. Tonic contracture remained a constant feature, trismus being so marked at times that the patient could not separate the teeth. Death occurred on the thirty-eighth day of the disease.

According to Curschmann,[1] the occurrence in adults of trismus and a tetanus-like condition in enteric fever is a rare event, and is an expression either of a most profound toxic action upon the central nervous system, or of especially severe complications.

Medical Societies.

MEDICAL SOCIETY OF LONDON.

A MEETING of this Society was held on Feb. 25th at 11, Chandos-street, Cavendish-square, W., Dr HERBERT SPENCER in the chair, when a discussion was held on the

Treatment of Fibroids of the Uterus.

Dr. CUTHBERT LOCKYER, opening the discussion, said that it had been estimated that uterine fibroids could be demonstrated in from 10 to 25 per cent. of all women, and that Frank had stated that 45 per cent. of uterine fibroids required treatment. If the possessor of the tumour was conscious of its presence the growth should be kept under periodic observation. He would advise radiologists who favoured submitting a symptomless fibroid to X rays to let sleeping dogs lie.

Operative Measures.

Uterine fibroids requiring treatment might be dealt with by palliative or by curative measures: radiotherapy could be classed under either head according to taste. He would, however, discuss surgical methods before dealing with radiotherapy. The routes of surgical attack might be abdominal or vaginal. Vaginal procedures included the removal of pedunculated fibroids from the body of the uterus and the cervical canal, hysterotomy, and in a certain number of cases hysterectomy. Abdominal operations included myomectomy, supravaginal amputation, and total hysterectomy.

Myomectomy.—Strenuous efforts were being made to popularise this apparently safe and ideal operation. The clear indications for its use were to preserve for the non-gravid woman a functional uterus, and to cope with a surgical emergency in the gravid state. He believed that after deep myomectomy with the opening up of the uterine cavity which was frequently necessary, convalescence was by no means smooth, and morbidity was increased. W. Mayo's statistics on myomectomy gave valuable information concerning subsequent fertility. Of 741 myomectomies (617 abdominal, 124 vaginal), 59 afterwards became pregnant, 44 children were known to have been born, and 15 women were pregnant at the time of reporting. Nineteen of these myomectomies were performed during pregnancy, and 23 women previously sterile were known to have one child or more after operation. In his own cases (continued Dr. Lockyer) he had performed 545 major operations for fibroids; 33 of these, or 6 per cent., were abdominal myomectomies, and there was one death, due to the presence of umbilical hernia and massed adhesions of the small bowel. He submitted that myomectomy during pregnancy was well tolerated by the gravid uterus, that it was not indicated for fibroids lying well up in the abdomen and causing no symptoms, and that in the presence of severe bleeding it made uncertain the possibility of saving the gravid uterus. In wisely selected cases, however, it had proved satisfactory.

[1] Curschmann: Nothnagel's Encyclopædia of Practical Medicine English Ed., 1902, p. 264.

Supravaginal Amputation or "Subtotal Hysterectomy."—This operation had divided gynæcologists into two schools—those who advocated its abolition from classical technique, and those who wished to retain an operation which had done more than any other to give repute to surgical treatment of fibroids. He considered that some surgeons went too far in refusing to admit that the subtotal operation had still a place in surgery. The risk of leaving behind a malignant or potentially malignant vaginal cervix could with care be reduced to a minimum. In 479 abdominal hysterectomies for uterine fibroids he had performed the supravaginal operation 284 times with five deaths—a mortality of 1·76 per cent.

Total Hysterectomy.—This operation was older than the subtotal one; the relative risks of the two were hard to determine, for (1) many total hysterectomies were done because the operator had no choice, having to remove the uterus for a large fibroid—as he should do in all septic cases—and (2) the same operator might use the method in easy cases, or whenever the circumstances did not prevent him from so doing. He would thus have two totally different types of case in his statistics of the same operation. A personal series of total hysterectomies numbered 195 with three deaths (1·54 per cent.) and a personal series of subtotal operations numbered 284 with five deaths (1·76 per cent.). Miles Phillips's results and his own together seemed to show that the primary risks of the two operations lay within quite small limits, the difference being slightly in favour of the subtotal operation. Before investigating the point he had imagined a higher relative mortality for the total operation. This view he no longer held, but time had not yet permitted him to redress the balance in the numbers of operations in his own practice.

The Fate of the Ovaries.

Hysterectomy for fibroids being more commonly performed on women over the age of 40, it might be argued that the sacrifice of both ovaries was unimportant, but he believed that even above that age it was better to conserve one if they were healthy. Phillips had stated that he had once taken pains to conserve ovaries, but had found that cases from whom all ovarian tissue had been removed gave the most perfect results. Prof. Blair Bell had said that when conservation of the normal ovary was not feasible, owing to infection of the appendages or other reasons, he always made an ovarian graft in women under 40 years of age. This was (continued Dr. Lockyer) probably the practice of most of those present; he believed that the Manchester, Sheffield, and Birmingham schools stood alone in advocating routine castration during hysterectomy for fibroid.

Radiotherapy.

The value of radium and X rays in checking hæmorrhage was now universally admitted. Hæmorrhage was the most prominent symptom of uterine fibroids. But treatment by radio-active bodies was not without risks in this connexion; quantitative dosage had yet to be attained, and there seemed more hope for radium than for Rontgen rays in respect of scientific measurement of dosage. Surgeons who had studied pelvic pathology realised that the uses of radiotherapy for fibroids of the uterus were confined within extremely narrow limits, variously described as from 17 to 5 per cent. of all cases. His own experience with the use of radium in the treatment of hæmorrhage had been in cases of chronic metritis, and the results had been favourable. In conclusion, he would, if asked as to the proportions of cases of uterine fibroids requiring removal, reply that 55 per cent. of all fibroids needed no treatment at all, 35 per cent. required removal, and the remaining 10 per cent. should be dealt with by radium.

Discussion.

Sir GEORGE BLACKER thought that most of those present would agree with much that they had heard

from Dr. Lockyer; fibroids which gave no trouble required no surgery, but when surgery was necessary, he had removed tumours weighing 2 lb. without damage to the patient. It had been said that removal should be performed to promote pregnancy, but he believed that the majority of women having fibroids were already sterile, and he would rather attend a woman with half a dozen fibroids than one with half a dozen scars of previous myectomies. Personally, he found that the advantages of total and subtotal hysterectomy were evenly balanced, provided the operation was carried out by expert hands; but subtotal hysterectomy was more difficult, and if it were practised by all sorts of operators throughout the country the mortality would rise above that of women dying from cancer of the body of the uterus after the cervix had been removed. The ovaries should never be removed in young women; such castration was unnecessary, the whole object of hysterectomy being to leave healthy organs behind. He considered that radium treatment had many advantages in a very small class of case, namely—tumours of small size, without complication of any kind. He had abandoned X ray treatment some years before, and when using radium was always careful to give an anæsthetic, to perform careful bimanual examination, to explore the interior of the uterus, and to carry out curettage. Patients reacted quite differently to radium treatment as regards dosage and time required. After-treatment was simple; the radium treatment could be carried out in a week-end, and in the light of the problem of waste of public money, owing to protracted periods spent by patients in hospital, this rapid treatment should be useful. He had treated 37 patients with fibroid tumours during the past few years; of 23 of these, treated before June, 1922, 21 were completely cured. One of the others had a sarcoma of the uterus. Of the 14 treated since, 12 were apparently cured.

Mr. T. G. STEVENS asked what was the result of the treatment on the fibroids themselves. He had seen a case treated by X rays, in which the patient appeared at the end of four years with a large sarcoma of the cervix, and had read of other cases. Patients treated in the West End of London or in the consulting districts of large cities might be safe enough, but what would happen to the cases of fibroids treated all over the country by inexperienced men? He had found a patient who was being treated with radiation and had a large ovarian cyst; fortunately, the instrumentation had been weak.

Dr. H. WILLIAMSON believed that present knowledge was only of temporary value; they knew nothing of the causation of fibroids, and it was to be hoped that in the future some histologist or biochemist would make a discovery in this direction. They aimed at leaving the uterus to function if possible. Many women with fibroids bore children, and sometimes fibroids grew so slowly as never to require treatment. Drugs had at best a very limited value in this connexion. Myomectomy offered great advantages for the leaving of a functioning uterus. He would limit the use of X rays, which had no place in the treatment of young women, or of those with large tumours, pelvic inflammation, polypi, or pregnancy. With regard to total and subtotal hysterectomy, he believed that in the virgin the uterus should be left, and in the multipara removed.

Mr. BECKWITH WHITEHOUSE confined his remarks chiefly to the results of the surgical treatment of myomata. In 16 years 438 consecutive operations for fibroids had been performed at the General Hospital, Birmingham, by Dr. Thomas Wilson and himself; in this series there were 14 deaths, a gross mortality of 3·19 per cent. During the same period 97 private patients were operated upon, with a mortality of 2 per cent. The total series therefore consisted of 535 consecutive cases with 16 deaths, a mortality of 2·9 per cent. The operation of choice was panhysterectomy, but the latter was associated with a mortality of 4 per cent. The subtotal operation, performed in about half the number of cases, had about half the mortality; it was reserved generally for large solitary myomata in single patients or sterile married women. There was no instance of carcinoma occurring in the cervical stump after subtotal hysterectomy. Dr. Wilson and he had concluded from an investigation that with total hysterectomy the conservation of the ovaries was unimportant; with subtotal hysterectomy, conservation was important if endometrial tissue also was saved; and that it was advisable to conserve both ovarian and endometrial tissue in women approaching the menopause. He had never seen a myoma disappear with radiotherapy, but had seen suppuration and intestinal adhesions resulting from use of the method.

Dr. N. S. FINZI said that radiologists depended on their gynæcological colleagues for the selection of cases suitable for radiotherapy. On the continent the majority of cases were treated by radiation—X rays or radium or both. He treated patients for three successive days, then made an interval of four weeks, and then repeated the three days' treatment twice, with a similar interval between; he had found the three series of treatments sufficient for all cases. He sometimes employed a special technique by which he gave one large dose, which caused a certain amount of discomfort and illness in some cases. The result in the fibroid was the gradual disappearance of the latter.

Mr. J. P. HEDLEY preferred operation to radiation when the fibroid was large and near the umbilicus, and when the woman was approaching the menopause. He had found radiation very useful in small tumours: it cured bleeding, and so far as he knew did no harm.

Dr. H. A. DES VŒUX, speaking from the general practitioner's point of view, said that in pre-operation days he had come to the conclusion that fibroids were not a dangerous disease. Later, he had found that when he told patients that they had fibroids they immediately ran off to a gynæcologist. He wished the gynæcologists would spread abroad among general practitioners their knowledge concerning the harmlessness of fibroids giving rise to no symptoms. Was irritation of the bladder a symptom sufficient to necessitate removal of the uterus?

The PRESIDENT said that no honest man would operate where no symptoms arose, although a small fibroid was present; but all large fibroids were degenerated, and should be operated on. He agreed with those who had spoken of the value of vaginal myomectomy and hysterectomy; abdominal myomectomy was also very useful at times. He was particularly interested in the conflicting views of the relative value of total and subtotal hysterectomy. He was glad that he had almost persuaded Dr. Lockyer to become a total hysterectomist; Dr. Lockyer's own figures showed that total hysterectomy, done in more difficult cases, had a lower mortality than the subtotal operation. Dr. Miles Phillips had actually said that total hysterectomy was better than the other. Cancer of the cervix occurred in a large number of cases after subtotal hysterectomy. In upholding the total operation, he had the support of the leading gynæcologists of Russia, Austria, Germany, and America, and he hoped that those of this country would come to give him theirs also. It was not right to use X rays and radium extensively in the light of their effects on the blood and intestines, particularly with regard to the extensive ulceration which sometimes resulted from their employment.

Dr. LOCKYER made a brief reply.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

Bayer "205" and Trypanosomiasis.

A MEETING of this Society was held on Feb. 21st at 11, Chandos-street, W., Sir P. BASSETT-SMITH, the President, being in the chair.

Prof. F. K. KLEINE read a paper on his recent expedition to Africa to investigate the action of Bayer "205" on trypanosomiasis. An abstract of the paper was given in THE LANCET last week. Prof. Kleine's paper was preceded by a microscopic demonstration of various types of trypanosomes in human and animal blood, and was followed by an interesting discussion.

Prof. WARRINGTON YORKE said it was commonly believed that sleeping sickness was a very fatal and rapid disease, whereas such was not the case. It was a question whether trypanosomiasis underwent a spontaneous cure. Prof. Kleine surmised that it did, and from cases which had been studied the inference was that spontaneous cure did take place, or at all events cure resulted after one or two injections of drugs such as salvarsan or atoxyl. Some confusion, he continued, had arisen in the consideration of sleeping sickness in Africa. Of the two types caused respectively by *T. rhodesiense* and *T. gambiense*, the latter was further subdivided into (*a*) a severe type of disease, and (*b*) a mild epidemic form found in West Africa. Of 35 cases of the mild infection noted in 1913, 24 were still alive ten years later. It was the opinion of the natives that the disease had simply died out. He quoted Dr. Lyndhurst Duke's opinion that the transmission of the disease was mechanical, in reply to which Prof. Kleine said that if the mechanical theory were correct, then it was inconceivable that trypanosomiasis should not have spread far beyond the bounds of tropical Africa. Prof. Yorke was not favourably impressed with the methods of the Rhodesian Government in allowing a native commission to undertake the work of investigation, but Prof. Kleine expressed himself as satisfied with the competence of the workers.

Prof. Yorke then showed a case, Mr. J., who had been cured of trypanosomiasis by Bayer "205" three years ago, and, as the patient himself testified, was now in excellent health.

Dr. G. C. LOW said that a distinction must be drawn between the infection as it occurred in natives as distinct from white men. Spontaneous cure might take place in a native, but he had never known of a spontaneous cure in the case of a white man. Bayer "205" had certain disadvantages; it was a poisonous drug and attacked the kidney. Very careful nursing was required to reduce the albuminuria.

Sir FREDERICK MOTT compared the affection of the central nervous system in trypanosomiasis to that in general paralysis of the insane. As other trypanocidal drugs he instanced tryparsamide, made at the Rockefeller Institute, and bismoxyl. He inquired if there might not be two varieties of trypanosome, on the analogy of the neuropathic and the dermopathic spirochætes, which Prof. Kleine, in his reply, admitted as a possibility.

Other speakers put forward the claims of tryparsamide and atoxyl, but Prof. Kleine reiterated his statement that Bayer "205" would seem to be the best remedy for sleeping sickness.

MEDICO-LEGAL SOCIETY.

A MEETING of this Society was held on Feb. 19th at 11, Chandos-street, Earl RUSSELL in the chair, when a discussion was held on the

Law of Nullity of Marriage.

Dr. S. HENNING BELFRAGE, who opened the discussion, described the law of nullity of marriage as a law peculiarly bound up with the practice of medicine, and stated that in dealing with the medical aspects of this law he was giving expression to a purely personal point of view. The law of nullity of marriage was based on the jurisdiction of the ecclesiastical courts, consolidated in the Matrimonial Causes Act, 1857. The principles of this law were not so much definitely laid down as traditional, and they were interpreted with increasing elasticity. Several times judges had said that the state of the law was not satisfactory; this was not surprising, since cases coming under the law had medical and surgical aspects, and there had been wide developments of science since the rules were laid down. It was doubtful if originally the rules had in view anything but visible faults of development as grounds for nullity. Any structural defect preventing intercourse was accepted as ground for the granting of a decree, but cases in which evidence of such defect appeared were exceptions rather than the rule. In a suit for nullity the medical evidence was, of course, most weighty, but the court considered itself at liberty to infer a great deal from the attitude of the parties concerned. The usual case to-day was based upon abnormality of sex functions. In these functions were concerned not only the spinal and lower brain centres, but also the higher centres, subserving imagination, will, and intellect, and subject to profound disturbance by the emotions. Next to the functions associated with food, those connected with sex were the most important in the body; according to the Freudian school the latter actually overrode the former, and formed the strongest factor of mental life. All psychologists must recognise the essential part played by sex relations in every human being.

Types of Abnormal Reaction in Sex Life.

In practice there were three variations in type of abnormal reactions of women to marriage. The first variation was where the attempt to consummate a marriage called forth resistance accompanied by emotional disturbance. These cases were called hysterical, but the word did not correspond with the psychological meaning of the term. In genuine cases these reactions were not to be controlled; they constituted a true nervous reflex of a high order. The second variation was vaginismus, a condition regarded with scepticism in legal quarters but familiar to neurologists. Here there was local pain or hypersensitivity, often severe, being the expression of a buried mental complex which the sufferer was unable to recognise. The slightest touch might set up spasm in these cases, but the real trouble lay in the mind. In both of these types a defensive mechanism was at work; fear of the husband's approach set up a partly voluntary, partly involuntary reaction or emotional disturbance, and the courts had recognised the condition as an impediment for some time past. The third variation in type was that of wilful wrongful refusal. Here the woman, if able to give any reason at all, could give no real reason; there was no question of shyness, timidity, or tactlessness on the part of the spouse, and the woman's conduct appeared in all senses unreasonable. She might plead fear of bearing children, fear of disease, &c., but such pleas were merely camouflage of a morbid mental attitude in sex matters.

Wilful Refusal a Symptom of General Instability.

Should such women be held responsible or should incapacity be inferred in these cases? Both Divorce Court and Court of Appeal seemed lately to have gone out of their way to dismiss suits of this nature. Sir Samuel Evans had upon one occasion differentiated between refusal and "steadfast persistent" refusal, and had later refused to grant a decree in a similar case. Recently the court had not required evidence of structural defect. Since the refusal arose after marriage, it was at one time held not to be a ground for annulment, but this decision had recently apparently been reversed. In one case the wife had stipulated before marriage that there should be no intercourse for six months after the ceremony; the husband foolishly agreed, the war intervened and parted the couple for some years, and when the husband rejoined his wife she persisted in wilful refusal. Lord Dunedin held that there was no plausible reason for the refusal, but inferred that the wife began with an ante-nuptial aversion, and was the victim of an invincible repugnance; he therefore granted a decree of nullity. In all

such cases the medical man would easily find evidence of instability in other aspects of life. These refusals were not wilful; they resulted from lack of will power. They were not wrongful, for the woman could not see that her attitude was wrong. He would like to see these cases grouped together as containing factors which constituted a real impediment. The mental make-up on which the conduct of these women was based was a definite departure from the normal to an extent which annulled the purpose of marriage as regarded in the eyes of the law.

With regard to the incapacity of the husband, in the majority of cases this was dependent not on faulty structure, but on faulty action; in the absence of defect the judge might infer complete incapacity. Then there arose the point of the fallibility of the medical inspector's opinion concerning the wife's virginity; the signs of habitual intercourse were evident enough, but the state of the hymen, dilatation of the vagina, &c., might fail to be conclusive. He had felt that the court sometimes demanded from a medical man more than the latter could be reasonably expected to give. He thought that it was time that a committee was appointed, consisting of lawyers and medical men having experience in divorce suits, to consider and report on the whole problem of abnormal relations between husband and wife.

The Legal View.

Mr. R. F. BAYFORD did not propose to touch upon the medical aspect of abnormality which had been so ably put forward. The discussion related to nullity qua impotence, not to the wider law relating to such questions as marriage by fraud, under duress, &c. One subject which had not been touched upon was that of nullity of marriage on the ground that one party was incapable at the time through mental trouble. The law concerning nullity through incapacity to consummate marriage seemed to him to be simple and clear. He had been unable to find any real difference in the law as expounded during the past 200 years; the principle seemed clear, although it had been differently applied in different instances. To put it shortly—and apart from considerations of age of the parties, which was a matter of common sense—the law said that if either of the parties to a marriage was incapable of consummating that marriage, after reasonable efforts to effect a consummation, the other party had the right to apply for a decree of nullity. There must be incapacity before the decree could be granted; if one of the parties wrongfully refused intercourse, no decree would be made. The differences which arose were not in the law, but in its application. In these cases only two people really knew the facts; from what he had seen it was sometimes very difficult for a medical man to ascertain those facts. He instanced a case where a couple had been married for a considerable time, after which the man obtained evidence that his wife had gone away with another man, and had for two week-ends occupied the same room in a hotel with the latter. On that evidence he petitioned for a divorce; the wife countered with a claim for nullity, and the medical evidence was that she was virgo intacta. The wife obtained her decree and both parties subsequently married again; the man now had a large family. Another great difficulty concerned the parties themselves; both had to give evidence, and usually in those circumstances the woman had no real knowledge of what the act of intercourse was. The man was not infrequently equally ignorant. Both thought that they knew all about it, but, apart from the general superficial knowledge common to everyone, it was hard to know how far to believe their statements. One party might not turn up, or might decline to contest the case; then one wondered if the case were genuine. He believed, however, that very few cases were not genuine. There were few things which people, especially women, hated more than to be considered incapable of marriage; and in such cases they would fight hard. That feeling, which was nearly as strong in men also, was the greatest safeguard against fraudulent cases. He would hesitate to advise alteration of the law with regard to the inference of incapacity in cases of apparent wilful refusal, for the only effect would be to assist the obtaining of fraudulent divorce. Some cases from the ordinary human point of view gave the appearance of mere wilful refusal; he believed that in many cases the real fact was that the person was incapable, and that the refusal, apparently voluntary, was involuntary. With regard to the application of the law, he felt that very likely all that was wanted was education as to what was, in fact, a real inability to consummate a marriage.

Mr. NOEL MIDDLETON thought that in the old ecclesiastical court cases it was difficult to find instances where a decree of nullity was granted save when evidence was given of structural defect of some kind. But there was no doubt that the ecclesiastical law was sufficiently elastic to enable judges to move with the times. He believed with Mr. Bayford that it would be better for the community that the law be left as it was. It was dangerous to venture a definition as to what form of wilful wrongful refusal should be admitted as a reason for the granting of a decree of nullity. The most likely change which the legislature might make would be to admit wilful wrongful refusal as a ground for nullity; but one act of copulation would then be sufficient to enable one party to provide against the marriage being declared null and void, and little could be said in favour of such a change, for although one act might be consented to, all others might be refused. Any such change would, he thought, be fraught with great danger. The law was quite capable of advancing with the times and with the advancement of medical science. He held that in 999 cases out of 1000 the law was quite sufficient as it stood. With regard to the provision concerning incapacity, the court was on firm ground, and if properly instructed by the medical evidence could deal with widely differing cases. But beyond the rock of incapacity was a sea of difficulties, wherein it was impossible to reconcile the views of doctors and legal men. With regard to wilful wrongful refusal, he instanced a case where a boy and girl were married without apparently realising the meaning of marriage, and separated immediately afterwards, the girl going home and the boy back to school. The marriage was kept secret for a long period, until the young husband came to realise that he was grown up, and disclosed the ceremony. The girl's mother, not realising that the marriage was actually a marriage, forbade the girl to see her husband again. The man went abroad for some time, and on his return his wife wilfully refused to have anything to do with him. There was no medical evidence of any sort of incapacity or nervous trouble; and it might be considered a hardship that the man could not get a decree. It was a hard case, but hard cases made bad law, and had a decree been granted it would have helped to make bad law. With regard to Dr. Belfrage's suggestion that a committee be appointed to consider the state of the law, it would be valuable to have the medical aspect discussed, but if he were to give any evidence before that committee he would urge that they gave no sanction to any alteration of the law. He would, however, say to those medical men who gave evidence that the oftener they could impress the judge with the medical aspect of the case the better would be the law applied in that case.

Further Discussion.

Dr. GUY WOOD agreed with Dr. Belfrage to a great extent. The mental condition had to be considered in these cases, but doctors were questioned almost solely as to physical conditions. It was well that this point should be emphasised.

Mr. H. W. BARNARD agreed with Mr. Bayford and Mr. Middleton that any change in the law of nullity would be harmful to the community. He pointed out that any facility for divorce in such cases would present a loophole of escape for those who wished to

avoid a marriage which they had found distasteful. At present a nullity suit must not be prosecuted in collusion, and if that law were held to, it would be fatal to allow divorce in these cases.

Earl RUSSELL said that the law of nullity as a whole contained a great deal of humbug, much of which had, however, come to be valuable. Although the general principle of the law had not changed, its application was no longer limited to physical questions as it had been 200 years ago, when nerve storms and neuroses were not dealt with, or, at any rate, not admitted, in the courts. The lawyers present had all opposed a change in the law, but the courts did actually legislate by extending the law. Divorce on the grounds of wilful and persistent refusal might lend itself to collusion, but all such difficulties would be met if divorce after a period of desertion were adopted. He would mention one matter not entirely germane to the discussion—namely, the procedure in cases of suits for nullity of paupers. In these cases considerable charges were made by medical men, although legal services were rendered free. It would, he thought, be well if some authoritative medical body would consider the matter of these charges. As to whether some new statute should be made or whether the courts should be left to broaden the law to meet individual cases, he would point out that it was easy to legislate without a clear apprehension of what would flow from the legislation. Would medical men suggest what change might be made in the order to examine which they received from the court?

Dr. C. GRAHAM GRANT, speaking both as a lawyer and as a medical man, believed that marriage was a contract to which sex intercourse was vital, and if such intercourse was not carried out the contract should be set aside. He was convinced that when the law insisted that a contract be maintained between two parties who did not consent to it, then the law was bad.

Mr. NORBURY thought that in certain cases of wilful persistent refusal it would help if the medical man who had given evidence, and had heard the parties to the suit give evidence, were again called later and asked his opinion of the mental state of the persons concerned.

Dr. H. J. NORMAN felt that the discussion of the mental side of such cases would raise interesting points in the future. At present the views of the newer school of mental experts were in a state of flux. With regard to uncontrollable impulse, unless a definite mental trouble was present it was difficult to accept or support a plea on that ground. But a person might marry, never consummate the marriage, and break down mentally soon afterwards; he instanced a case of manic-depressive insanity where this happened, and emphasised the difficulty of such cases, in which the conditions of insanity might alternate with no intervals between them or might occur at prolonged intervals, the victim being completely sane between attacks.

Mr. G. C. TYNDALE said that some lawyers regarded with great uneasiness the present state of the law of nullity of marriage. Many people felt that the state of affairs in face of a wilful and wanton refusal was an abomination, the unfortunate petitioner having no release at all. He hoped the legislature would see to it that this old and genuine grievance was swept away.

Dr. BELFRAGE, replying, said that the most important thing was to get a definition of incapacity. He had not wished to urge an alteration of the law, and thought that such alteration would be very difficult. He would, however, suggest that the words "physical or nervous impediment" be included in the affidavit which a medical man was asked to supply to the court. The personal pride of the parties of which Mr. Bayford had spoken made the medical man's task no easier. His own feeling was that the judge, rather than counsel, required to be educated.

ROYAL SOCIETY OF MEDICINE.

COMBINED MEETING OF THE SECTIONS OF MEDICINE, NEUROLOGY, OPHTHALMOLOGY, AND OTOLOGY.

VERTIGO.

A MEETING of the combined sections was held on Feb. 26th to discuss the subject of Vertigo, Dr. ROBERT HUTCHISON, the President of the Section of Medicine, being in the chair.

The Standpoint of Medicine.

Sir HUMPHRY D. ROLLESTON opened from the standpoint of medicine. Accepting Mr. Sydney Scott's definition of vertigo as "a state of consciousness of the effect on motor centres of a want of harmony between afferent impressions," he said it could be held to include disturbances of the whole vestibular system, however caused, whether by organic lesions or by toxins acting directly on nervous tissues, or indirectly by inducing vascular spasm or dilatation. The afferent impressions, in the order of importance, were vestibular, ocular, kinæsthetic (muscular, articular, and visceral sense of movement). There must be reservations to any general rule. Gowers, who considered that 90 per cent. of cases of vertigo were aural in origin, referred, under the heading of "Pseud-aural Vertigo," to cases with slight evidence of labyrinthine disease, in which that authority supposed that a disturbance of function of the cortex set up by a slight peripheral derangement of the semicircular canals became gradually independent and purely central.

Diagnosis by Vestibular Tests.—Sir Humphry Rolleston said neuro-otology or analysis by the new vestibular tests enabled a diagnosis to be made of organic lesions of the vestibular apparatus, and in that way the points to be discussed by a physician could be narrowed down—as distinct from the specialist spheres of the otologist, the ophthalmologist, and the neurologist—to two chief categories: (1) What was the evidence that the action of toxins, transient vascular changes, or functional disturbances of the part of the cerebral cortex where the sensations concerned in equilibration normally met in harmony, might cause vertigo; (2) the ways in which general disease or visceral disorders affected the vestibular apparatus. Perhaps the vestibular tests could not be relied on to detect transient changes of the vestibular apparatus; hence in a case of vertigo in which, in the interval between attacks, the tests did not show abnormality, it might be impossible to determine that a passing functional disorder of the cerebral cortex was responsible, rather than one of other parts of the vestibular apparatus. Toxic, vascular, or functional disturbance at the cortical end of the vestibular system might occur, judging by epileptic auræ and borderland cases of epilepsy—viz., vertigo as an aura and the occurrence in an epileptic of vertigo without a fit. It would be interesting to hear if deaf-mutes with complete destruction of both labyrinths experienced vertigo when put under the influence of vertiginous drugs, such as quinine, alcohol, lead, and enterogenous poisons such as indol. A number of poisons due to defective metabolism were considered by many capable of causing vertigo; but at present one could not say where the transient disturbances causing vertigo occurred. Under the second heading, that of general disease, Sir Humphry Rolleston remarked that it had been said anaphylactic conditions might affect the semicircular canals. Some patients with hypersensitiveness, as shown by asthma and urticaria, had attacks of giddiness excited by taking certain articles of food, and the attacks ceased when those foods were no longer eaten. Parkes Weber thought it possible that angioneurotic manifestations in the labyrinth, by increasing the pressure of fluid in relation to the semicircular canals, might cause vertigo; and Vernet suggested that endocrine disorders might produce it by modifying the vasomotor conditions in the vestibular

labyrinth, and therefore advocated the oral administration of adrenalin. But knowledge on this was as yet uncertain.

Gastric Manifestations and Vertigo.—He said the gastric manifestations and vertigo were now widely regarded as concomitant effects of vestibular disturbance instead of standing in the relationship of cause and effect. Yet gastro-intestinal disturbance could conceivably be a primary cause of vertigo, either reflexly through the brain-stem, or by generating poisons which might act directly on the vestibular system. Sometimes vertigo was thought to be due to biliousness, and it might be that the hepatic insufficiency prevented the neutralisation of enterogenous poisons, such as indol. In two recent cases of headache and vertigo Holmes found an excess of uric acid in the blood and the symptoms disappeared when this excess was corrected.

Vertigo and Arterial Disease.—The association of arterial disease with vertigo could be explained in several ways. The high blood pressure, which so commonly preceded and caused arteriosclerosis, was associated with increased pressure of the cerebrospinal fluid and of the extra-labyrinthine fluid, and great variations might occur in both. And the vessels in this disease were more than normally prone to spasm and the latter had been stated to be a cause of vertigo. Attacks of vertigo might be due to transient cortical anæmia depending on vascular spasm. It was interesting to note the occurrence of vertigo in the Stokes-Adams syndrome, and its absence in simple heart-block. In cases of arteriosclerosis combined with renal disease vertigo could be explained in several ways. Embolism of the vessels of the labyrinth, such as might occur in malignant endocarditis, might so modify the conditions in the semicircular canals as to cause vertigo. Possibly the giddiness of caisson disease was due to embolism of bubbles of nitrogen in the vessels of the labyrinth, and the large arc of the cerebral cortex might be similarly affected. Laryngeal vertigo had been explained in various ways, and with regard to blood diseases, both anæmia and erythræmia might sometimes cause giddiness; the question was on what part of the apparatus the altered blood exerted its influence. In erythræmia, probably plethora would affect the vestibular labyrinth more readily than the central nervous system.

In conclusion Sir Humphry Rolleston referred to paralysing vertigo, described as occurring in small epidemics around Geneva in the eighties, by Gerlier. Since 1901 the disease had not been seen. It appeared in the summer and vanished with the onset of cold weather, and was confined to agricultural labourers or shepherds. It was considered to be due to stable infection. It appeared never to have been fatal.

The Neurological Aspect.

Dr. GORDON HOLMES discussed the subject of vertigo as arising from diseases of the central nervous system. He referred to the difficulty of ascertaining what was the exact condition to which the patient applied the term dizziness or giddiness. There was a tendency to regard the patient as stupid, but in any attack of vertigo there was always transient mental confusion and marked inattention. Another difficulty was to exclude all peripheral factors, especially lesions involving the semicircular canals and labyrinth, and producing vertigo either temporarily and directly or secondarily leading to an instability of the central nervous system or some portions of it. He set out the classification of vertigo which had been of practical use to him.

Classification of Vertigo.—The first class were the cases in which the vertigo arose from local lesions involving the central connexions of the vestibular nerve. The portions of the central nervous system which were only indirectly connected with the labyrinth, parts of the medulla, pons, cerebellum, and the mid-brain. Intra-medullary causes were probably less common. Vascular lesions of the cerebellum were not uncommon, and in these vertigo was frequent. He did not think pure cortical vascular lesions, such as small softenings on the surface of the cerebellum, often caused giddiness, but when the softenings extended to the central nuclei, particularly when they involved the peduncles, vertigo was very common. Tumours, especially of pons and cerebellum, were perhaps an even more common cause. And degenerative processes, affecting chiefly the cerebellum, and frequently the pons, might cause vertigo, but not so dramatically.

The second group of focal lesions to be considered were those in the fore-brain, especially in the cerebral cortex. He did not know of any unequivocal evidence that any form of disease of the basilar ganglia, or even the deep portions of the central white matter of the brain, caused vertigo in a direct way. But any lesion of the cerebral cortex that produced spasmodic phenomena could cause vertigo; tumours of the frontal lobe of the brain were a good example of this.

In his third class he placed vertigo, which was merely a symptom of another disease, occurring as an equivalent manifestation in epilepsy or migraine. Vertigo was not uncommon in epilepsy, first as a warning of the attack, and secondly replacing the attack. People who suffered from migraine seemed more liable to have vertigo, quite apart from their megrinous attacks.

His fourth class were subjects of hysteria. He asked whether vertigo was ever a hysterical manifestation. His own view was that vertigo was never due to hysteria, though the symptoms of the latter were so protean that the patient would frequently complain of what seemed to be vertiginous manifestations.

The Ophthalmic Standpoint.

Mr. J. HERBERT FISHER introduced the subject from the ophthalmological point of view, giving his own personal observations. He referred first to objective localisation or objective orientation. Disorder of this might lead to metamorphopsia, polyopia, and errors of judgment, but he did not think it ever caused true vertigo, though when other factors were present, it would add to the mental confusion. It had been said that unaccustomed visual sensations might, per se, cause vertigo, and he believed that unperceived ocular movements played the important part in causing the vertigo resulting from gazing at a waterfall. Patients often used the word giddiness in a sense which was far from scientific or accurate; but correction of astigmatism by oblique cylinders certainly disturbed ocular judgments, and refraction errors should not be ignored in dealing with cases of vertigo. The relative values of objective and subjective orientation was an interesting question. In a man with only one eye available, no sense of vertigo was experienced Abnormal impulses from disordered ocular muscles might reach Deiter's nucleus in the cerebellum, and in the latter might provide reflex irritation of the labyrinthine nerve centre, and thus a sensation of vertigo. This was at least worthy of consideration in regard to the vertigo of insular sclerosis when nystagmus was present. Vertigo was a frequent symptom in disseminated sclerosis. When ophthalmoplegia externa was also present, the resulting diplopia would add further to the confusion of the visual judgments. He gave a number of reasons for his belief that the sense of vision contributed to equilibrium only when it affected consciousness through the higher perception centres. He regarded equilibrium as a subconscious process maintained by tactile and muscular sense, and provided for, above all, through the semicircular canals, the vestibular nerve, and the cerebellar centres. To the sum total of muscular sense the muscles of the eyeball contributed their quota; disorder of the muscular and tactile elements of balance produced incoördination, which might suffice to cause stumbling movements, or loss of equilibrium sufficient to produce a fall without originating any perception of vertigo. The higher developed special

sense of vision could operate only as a higher mental perception. Normal visual impulses, normally projected on the sensorium, contributed to equilibrium, and might be able to control a vertigo generated by disorder of other mechanisms. Unaccustomed impulses generated by a disordered retina would produce no sense of vertigo if they were normally transmitted to and projected upon the sensorium, though they might disorder visual judgments.

The Otological Side.

MR. SYDNEY SCOTT, by means of an instructive series of slides, dealt with the otological side of the question. If a patient was able to hear the very low tones on the musical scale, the fenestra of the labyrinth could be adjudged intact. In general, inability to hear low tones indicated an interference with the ossicular apparatus of the middle ear, and when the lowest heard tones were quite high, there was present a more gross lesion than fixation of the ossicles. Two cases in which this was so were found to have auditory nerve tumours. When a patient subject to vertigo afterwards became deaf, he ceased to be giddy.

Conditions met with in Otology causing Vertigo.—With regard to the conditions met with in otological practice which set up vertigo, it was either an interference with the normal labyrinth or a destruction of the normal labyrinth. He showed slides of middle ear infections which had destroyed the membrana secondaria and set up a process of disintegration. Another class of causes interfering with the labyrinth were those in the region of the auditory nerve itself. He had seen over 40 cases of tumour in the lateral recesses which had affected the auditory nerve and caused marked deafness and vertigo; in some of these there had been vertigo without deafness, and in the latter the lesion had not been in the recess angle, but lower down in the nuclei in the medulla—i.e., the cochlea escaped and the vestibular nerve was involved. Concerning the effect of destruction of the labyrinth as a whole, he showed the photograph of a dog whose labyrinth was destroyed, to illustrate the characteristic stance due to the ablation, with displacement of the head and abduction and slight extension of the extremities. He proceeded to discuss, by the aid of a diagram, the mechanism of the vestibular reactions and tests, and the influence of various diseases, especially sinusitis, in causing vertigo. He concluded by drawing attention to the importance of making proper tests before arriving at conclusions as to the condition present.

Sir JAMES DUNDAS-GRANT said that one point was the difficulty of diagnosis in the cases which came suspected of being Ménière's disease, cardiac syncope, laryngeal syncope, petit mal. Small doses of quinine had an extraordinary action in checking, and almost stopping, the attacks of aural vertigo. If in a unilateral case the quinine did not diminish the vertigo, probably it was not a case of semicircular canal defect. He thought the quinine equalised the two labyrinths by its sedative action on the sound one. In the normal state the movement of the stapes and of the membrane of the round window acted as safety valves, and there might be a small vascular increase of pressure in the internal ear, but it did not cause disturbance because the two safety valves acted, but when they were fixed this action was lost. That, he thought, was the explanation of Mr. Sydney Scott's observation that one could often check the vertigo by compressing the carotid. In some of the worst cases the speaker had had to deal with, the cause had been cholesteatoma. With regard to the sympathetic, there had been experiments carried out recently on the action of the sympathetic nerve on the circulation by pressure in the labyrinth, and the consequent changes in the responsiveness of the labyrinth to the caloric tests. One German experimenter blocked up both the vertebral arteries just as they entered the skull, and also tied one carotid canal, so that the circle of Willis was supplied by only one carotid. The experimenter then tested the rapidity of response to the caloric test in the ear on the same side as the open carotid and observed the length of time needed to induce nystagmus. He then stimulated the sympathetic in the neck on that side, and it caused contraction of the blood-vessels, and a great deal longer was required to induce a response to the caloric test. The speaker's own observation was that the vertebral canals could be digitally compressed in the living subject by exerting the pressure in the sub-occipital triangles, at a point a little below the level of the mastoid. He tried the effect in a normal person of compressing the vertebrals in this way and found that it took distinctly longer to induce while this pressure was being maintained. He also referred to the fact that the late Sir Victor Horsley accepted Mills's localisation of a centre for the sense of equilibrium in the temporal lobe. Concussion, he considered, was a frequent cause of vertigo. Erichsen had pointed out that in "railway spine" following upon concussion, great relief was obtained by taking small doses of perchloride of mercury, so that patients would often return and ask for the medicine to be repeated. The speaker had found that drug had the same effect in the case of the vertigo caused by concussion.

Reviews and Notices of Books.

DIPHTHERIA: ITS BACTERIOLOGY, PATHOLOGY AND IMMUNOLOGY.

By FREDERICK W. ANDREWES, WILLIAM BULLOCH, S. R. DOUGLAS, GEORGES DREYER and A. D. GARDNER, PAUL FILDES, J. C. G. LEDINGHAM, C. G. L. WOLF. London: H.M. Stationery Office. 1923. Pp. 544. 12*s.* 6*d.*

THE latest monograph of the Medical Research Council, appropriately dedicated to Emile Roux, has been designed by its authors to cover the whole range of our scientific knowledge of diphtheria. It was a great task to attempt, and its execution is worthy of the Bacteriological Committee of the Council. The work as it stands is not a collection of independent chapters revised by a single editor, but all the seven bacteriologists take collective responsibility for the whole. No comprehensive work on the bacteriology of diphtheria has been issued for the last 15 years, and a glance at the bibliography in this monograph, which runs to more than 100 pages, shows how desirable it is to have the research of the last decade presented in a compact form. The modern story of diphtheria started with a brilliance which could hardly be maintained, for Behring's discovery of antitoxin—one of the greatest ever made in medicine—was fortunate in connexion with a disease in which antitoxic immunity counts as in no other.

The volume opens with a chapter on the history of diphtheria which recalls the antitoxin treatment by Geissler of the first child in v. Bergmann's clinic in Berlin on Christmas night, 1891, and Amand Ruffer's notable service in producing the antitoxin at the Lister Institute (then called the British Institute of Preventive Medicine) early in 1895. The second chapter deals at length with the bacterial genus Corynebacterium, a sub-group proposed by Lehmann and Neumann, accepted by the Society of American Bacteriologists, and now adopted by the Council. The term diphtheria bacillus is used throughout the monograph as synonymous with *Corynebacterium diphtheriæ*. The third chapter treats of the toxin of the diphtheria bacillus, its composition, preparation, and properties. Although a certain amount of experimental evidence suggests that the washed bodies of diphtheria bacilli exert a poisonous action distinct from that of the toxin proper, the authors hold, nevertheless, the belief to be justified that endotoxin does not play any significant rôle in the causation of symptoms. A very interesting chapter sets out the relation between diphtheria antitoxin and other antibodies, leading up to the conclusion that the antitoxic power of diphtheria antiserum is undeniably its most important property, the theory

that sera possessing full anti-bacterial powers (bacteriolysis, agglutination, &c.) would have a greater therapeutic efficacy remaining unproved. A full account is then given of the pathology of the disease, experimental and natural, the diphtheria bacillus producing general lesions mainly through the absorption of its toxin into the circulation. The gross anatomical lesions met with after death are very varied, and the report emphasises the difficulty of separating the action of the diphtheria bacillus from that of other micro-organisms which may be present. Under the heading of laboratory diagnosis, it is pointed out that the three racial sera prepared by A. S. G. Bell cover a considerable proportion of the diphtheria strains occurring in this country, and that where these sera are available an unequivocal positive result may be regarded as good confirmatory evidence of the nature of a doubtful bacillus.

A chapter on the serum treatment of diphtheria contains much information of value to the practitioner. Serum sickness is considered as an instance of allergy allied to, but not identical with, anaphylaxis, and the authors question whether true anaphylactic shock ever occurs in man. Nevertheless, intravenous reinjections should be reserved for the gravest and most urgent cases. The chapter on the incidence and spread of diphtheria includes a full description, with excellent coloured plates, of the Schick test and the subsequent toxin-antitoxin immunisation. The results obtained by W. H. Park, in the Brooklyn and Manhattan schools, are duly set out, and the conclusion reached that this mass effort reduced the number of cases of diphtheria to one-fourth—promising enough, when it is borne in mind that most of the immunisations were carried out by methods since superseded. An interesting section deals with the disputatious matter of the spread of diphtheria by animals; while scabs in cows are clearly not due to diphtheria, yet under some conditions, the authors admit, they may be a factor in its spread. Diphtheria may be superimposed on another infection owing to the habit of milkers spitting upon their hands. On the other hand, the circumstantial stories of cats suffering from typical diphtheria and transmitting it to children do not bear close serological examination. W. G. Savage found that the diphtheroids present in cats' throats produced no acid in broth.

In the chapter on prevention the question of the disinfection of carriers is set out with references. As far as available records go, the only form of treatment which appears to have decisive results is operative removal of infective tonsils and adenoids; since the carrier is himself immune to diphtheria, the harmless results of this operation are in keeping with expectation. A final chapter on diphtheroids is a remarkably readable presentation of a subject apt to be neglected except by the bacteriologist. No doubt, could once the systematic position of the non-virulent *C. diphtheriæ* be satisfactorily cleared up, the study of the parasitic diphtheroids of man and animals would become a botanical pursuit. At the present time this stage is far from being reached: even the morphology of individual strains of corynebacteria on the same medium, under the same conditions, is by no means constant.

As an exposition of the existing stage of knowledge in regard to diphtheria, this monograph will prove of great value to the medical profession and to scientific workers generally. Not the least, as the preface indicates, will it serve a purpose in showing how imperfect is our knowledge of diphtheria even at the present day, and in stimulating further research upon the problems as yet unsolved.

PSYCHOLOGY AND MORALS.

By J. A. HADFIELD, M.A. Oxon., M.B., Ch.B. Edin., Lecturer in Psychology, King's College, London. London: Methuen and Co. 1923. Pp. 186. 6*s*.

SEEKING to provide moralists with that knowledge of psychology without which moral teaching so often fails, Dr. Hadfield brings together some practical applications of modern theories and gives in rather dogmatic form, for which his preface frankly prepares us, his own interpretation of those theories. The simplicity thus attained is sometimes deceptive, as when he writes that it is unnecessary to deal with the "transference." Dr. Hadfield is fortunate if he has never met that hostile transference which nullifies all treatment until it is dealt with. There still appears to be a moral significance attached to the question of "free-will," and the author's efforts to reconcile it with psychic determinism are rather confusing. The merit of the book lies in showing that the recognition of impulses is necessary for a practical morality. This leads up to the psycho-analytical distinction between repression and control, processes often diametrically opposed and yet regarded as identical by those who think of psycho-analysis as teaching that we should allow a free rein to our instincts. As Dr. Hadfield says, "We cannot control our instincts as long as we repress them." The definition of "moral law" is difficult, and the author's confidence in its existence, "written on the tables of the heart," seems to rest, in spite of his protests to the contrary, upon what society approves or ostracises (p. 140). As a working principle this is excellent, but it scarcely possesses absolute validity. The book fulfils its main purpose, and should be of help to those who do not realise what psychology has to offer in the understanding of the nervous, the delinquent, and the many other misfits of modern life.

ANATOMY AND PHYSIOLOGY.

A Text-book for Schools of Nursing, Normal Schools, and Colleges. By JESSE FEIRING WILLIAMS, M.D., Professor of Physical Education, Teacher's College, Columbia University, New York. London and Philadelphia: W. B. Saunders Co., Ltd. 1923. Pp. 523. 15*s*.

PROBABLY no task with which an instructor in physiology is faced is so difficult as that of teaching beginners who have no knowledge of anatomy or biology, physics or chemistry. It is difficult to know where to begin. The author of this volume begins with the structure of the cell, the formation of the embryo, the simple tissues, and then leads on to the skeleton, muscles, and nervous system, before considering the circulation and other visceral systems. We do not much like this arrangement, logical though it may seem, but this is the only criticism we have to offer in reviewing this excellent little book. The illustrations are clear and up to date, the text is well written, and shows that the author has a real grasp of his subject, and the references to pathology and medicine make the book very valuable to the readers for whom it is intended. Directions for useful practical exercises, more for the guidance of the inexpert teacher than for the student perhaps, are included. If the book is used in conjunction with clear and simple lectures, students will get a very good idea of physiology from it.

ENCYCLOPÆDIA MEDICA.

Second edition. Vol. X., Obligate to Potash. General Editors: Vol. I.–VIII., J. W. BALLANTYNE, M.D., F.R.C.P.E. Vol. IX.–X., ALEXANDER GOODALL, M.D., F.R.C.P.E. Edinburgh: W. Green and Son. 1923. Pp. 672. 30*s*.

THE Encyclopædia Medica is so arranged that long articles are written on important subjects, while others of less moment are passed over in a few lines. The articles for the second edition have, in many cases, been entirely rewritten, while there is one new article. Prof. J. A. Milroy, discussing the physiology of the pancreas, gives a very good account of the recent work on the functions of the organ with especial relation to the internal secretion. The two kinds of cells in the islands of Langerhans are described, but an important point in the proof of the connexion of the cells with diabetes, supplied by Allen's partial pancreatectomy and overfeeding with sugar, has been omitted. Reference is made to the new work suggesting that the sugar present in the blood of

normal persons is in the γ form, whereas in the patient with diabetes mellitus this is not the case.

A clear account is given of the discovery and properties of insulin. It is a great advantage to have this article brought so thoroughly up to date. The section on the diseases of the pancreas, which does not include diabetes mellitus, is well written. The description of acute pancreatitis and its treatment should be especially useful. The new article on oxygen has been written by H. Whitridge Davis, and gives a clear account of the present standpoint of physiology. Seeing that pneumonia is also dealt with in this volume, it is an advantage to have the therapeutic uses of oxygen set out here. The point is made that oxygen should be given early and that the patient should be prevented from becoming cyanosed. The various methods of administration are described and are placed in the following order of election: (1) an oxygen chamber; (2) the Haldane mask; (3) various emergency methods. Oxygen chambers are rarely available. The Haldane apparatus has many advantages and is most useful for the mild cases, but often cannot be tolerated by the seriously ill patient. When this is so, a funnel must be used, and as Dr. Davis points out, this is a wasteful method. No note is taken in this section (although it is mentioned in that on the treatment of pneumonia) of the use of a nasal catheter, which can often be tolerated when the mask is rejected, and is an improvement on the funnel method. Pneumonia is dealt with fully, both from the bacteriological and the clinical side. A detailed account is given of the five types of pneumococci and the methods of distinguishing them. Statistics as to the value of the serum here given appear to indicate that however useful serum may be for the treatment of pneumonia in small animals like the mouse, it is of no great value for large ones like monkeys and man. The prophylactic use of vaccines in the prevention of pneumonia is discussed; the evidence seems to point to a reduced incidence and a diminution of the severity of the infection. This section on pneumonia is full of information, and should be of the utmost use to the practitioner faced with a severe case of the disease.

The editing has been well done, and the encyclopædia is of definite importance as a work of reference for medical men.

GERIATRICS.

A Treatise on the Prevention and Treatment of Diseases of Old Age and the Care of the Aged. Second edition, revised and enlarged. By MALFORD W. THEWLIS, M.D. With introductions by A. JACOBI, M.D., LL.D., and I. L. NASCHER, M.D. London: Henry Kimpton. 1924. Pp. 401. 21*s*.

IN the treatment of many complaints in the aged Dr. Thewlis urges especial attention to the condition of the kidneys. In the chapter on Senile Heart Disease, in that on Senile Rheumatism, and, again, in the discussion on the Complications of Senile Nephritis, the author emphasises the importance of nephritis. He states (p. 133) that "senile nephritis is one of the most treacherous conditions we are called upon to treat, because there are many complications that develop in organs which are distant from the kidneys, while the latter organs frequently display little evidence of disease. In other words, we may find serious symptoms, for example, in the brain, due to uræmia, yet the urinary picture may not be serious." Some cases of senile nephritis may be connected with old syphilis, and the author points out that the diagnosis in such cases is a most important matter with regard to the treatment to be adopted. In the chapter on Senile Bronchitis (p. 193) it is mentioned that a diet for nephritis will be satisfactory, even though the patient may not have nephritis. A microscopic examination of the urine should be made to discover whether the kidneys are diseased, since the latter is a common cause of senile bronchitis. Even of senile chorea, kidney disease is considered a possible cause!

In very rebellious cases of senile pruritus the author refers to good results obtained by the cautious use of radium or X rays. One chapter is devoted to the curability of some cases of hepatic cirrhosis and ascites. The author holds that some of the worst cases of "gin-drinker's liver" are seen in men who have been total abstainers all their lives. Ascites is more likely to be cured when the hepatic cirrhosis is hypertrophic. Atrophic hepatic cirrhosis is, of course, incurable, although regeneration of liver substance occurs. The use of alcohol is recommended in certain conditions. Special chapters added in the second edition are those on Electrotherapy and Opotherapy. One of the author's most characteristic chapters remains practically unaltered. It is entitled Keep Senile Cases out of Bed, and ends thus: "Getting out of bed spurs the aged sufferers to fight their battle more courageously. After all . . . the important thing is to encourage them and to give them plenty of attention. A talk about things that interest them sometimes has a better effect than medicines."

INFANTILE SURGERY.

Précis clinique et operatoire de chirurgie infantile. By L. OMBRÉDANNE, Surgeon to the Hospital for Sick Children, Paris. Paris: Masson et Cie. 1923. Pp. 1139.

The author of this excellent work points out in his preface that the surgeon who specialises in diseases of children must practise all the surgical specialties with the sole exception of ophthalmology. The book therefore covers a very large field extending from oto-rhino-laryngology to orthopædic surgery, leaving obvious and inevitable gaps in each specialty, but forming a very well-balanced whole. If the pathology is at times a little vague and the embryology occasionally unorthodox according to modern English views, the excellence of the clinical study of the cases and of the descriptions of operative procedure and after-care more than compensate for this. There is no bibliography; the author writes almost exclusively from a large personal experience which amply warrants his well-defined and dogmatic views. The book can be thoroughly recommended to those interested in children's surgery; they must be prepared to find divergences from English practice. The French is easy to read, and the copious illustrations are quite clear.

POISON MYSTERIES IN HISTORY, ROMANCE, AND CRIME.

By C. J. S. THOMPSON, M.B.E. London: The Scientific Press, Ltd. 1923. Pp. 412.

THE subject of poisons is a very interesting one, though it is a little difficult to see why poison mysteries are almost automatically called romantic. Crime by the agency of poisoning frequently presents absorbing legal and medical problems, but the central actions are almost invariably sordid and not romantic. The influence of poisoning on history is undoubted, but how great that influence has been we can never know, because it was almost a recognised political game to allege that the sudden disappearance of a monarch, an heir, or a minister, whose presence was inconvenient to any political party, had been removed by the instrumentality of poison at the instance of that party.

In the first part of Mr. Thompson's book there are collected notes at greater or less length upon most of the historic poisoning cases, and in this section there are also some distinctly interesting chapters on the curious methods employed by certain villains, and upon the love-philtres which have played a part in social life from the oldest days. The second part of the book tells the stories of 20 or 30 well-known murder cases: here the author is for the most part going over quite old ground, and a large number of the stories have been published with far greater detail. It is convenient, however, to medical men to have an outline of these stories bound up in one volume of so convenient a size, when further medico-legal details will be accessible where they are required.

Mr. Thompson's compilation is well written and readable from cover to cover. He has only designed to give outlines of his subjects, and these are clear and accurate.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

IX.—CERTIFICATION IN INSURANCE PRACTICE.

BY LEONARD SHOETEN SACK,
OF THE MIDDLE TEMPLE, BARRISTER-AT-LAW; JOINT AUTHOR OF "MEDICAL INSURANCE PRACTICE."

. . . . report me and my cause aright
To the unsatisfied.—*Hamlet*, Act v., Sc. 2.

THE evidence given at the recent capitation fee inquiry indicated that certification is the most criticised of the many duties required of the insurance practitioner. The profession contend that the certification rules are quite unnecessarily complicated and onerous. The case prepared by the Insurance Acts Committee went so far as to describe them as "oppressive and menacing," and expressed the view that they were not designed to secure to the insured person the sickness benefit properly due to him, but rather required the doctor to perform a service to the approved society under a threat of penalty. This expression of opinion is significant, because in no other respect did the profession complain that the panel doctor's duties are *unnecessarily* burdensome. The approved societies, on their side, allege that their funds suffer serious loss through loose and irregular certification.

Certification has necessarily a very real bearing on the whole financial structure of the national insurance scheme. Out of the total £22 million spent on benefits in England and Wales in 1922, more than £11½ million was for sickness and disablement benefit, and represented cash paid out to individual insured persons on the evidence of the doctor's certificate. This financial aspect was recognised by the Government in 1913 when a Departmental Committee was set up to report on the sickness benefit claims. The outcome was the appointment in 1920 of the regional medical officers, whose principal duty it was to act as referees to settle doubtful or disputed cases of incapacity. The number of references to these officers increases each year. The total references for England and Wales during the first three-quarters of 1921, 1922, and 1923 were 46,338, 81,200, and 107,242 respectively. In all, 288,728 cases had been referred up to September, 1923. In 52,558 of these—18 per cent.—the R.M.O. decided that the patient was capable of work, while in 41 per cent. of the cases the patient failed to attend for examination, usually no doubt, because he had meanwhile been certified as fit. While these figures do not necessarily connote widespread carelessness or wilful irregularity, they do suggest that health insurance certification is not yet fully satisfactory, and in particular that considerable difference of opinion exists as to the circumstances which justify the conclusion that a patient is incapable of work.

Doubtful Incapacity.

The certification of incapacity may obviously present considerable difficulties. A detailed discussion of those difficulties would involve medical considerations into which it would not be proper for a layman to enter. No precise definition of "incapable of work" has been officially issued, and it seems clear that no administrative decision or financial consideration should materially limit the professional judgment of the doctor. But cases arise where the question is not solely medical. Where the illness is one from which the patient is likely to recover within a reasonably short period, the only consideration is whether, for the time, he is capable of following his normal occupation or employment. Where, however, the illness is protracted or chronic, the question will, at some stage, arise as to whether the patient, although still incapable of following his previous occupation, is able to undertake some other remunerative work. The latter question, it may be argued, is one on which it is scarcely fair to expect the busy general practitioner to form a considered opinion, for it may involve inquiry into non-medical matters—e.g., the kind of remunerative occupation which is, in fact, available. It is true that the responsibility for deciding for how long cash benefits should, in such cases, continue rests with the approved society, but the doctor has still to decide when the incapacity certificates shall cease. Now these are typically cases which, it is suggested, should be referred to the R.M.O. It is one of the specific duties of that officer to decide cases of this kind, and there seems no reason why the practitioner should not free himself of unnecessary responsibility by taking advantage of the machinery which has been provided. At present, nearly all R.M.O. references are originated by approved societies and this tends to create an impression unfavourable to the doctor. It is sometimes feared that such references will involve loss of time to the busy doctor, in view of the requirement that he must attend at the examination if required to do so. In practice, however, the R.M.O. studies the convenience of the doctors and does not unnecessarily require his attendance. In any case, a reference by the doctor himself will ordinarily involve less annoyance and loss of time than will an ultimate reference by the approved society.

Obliging the Patient.

Most of the irregularities in certification can be traced to a few causes, which will here be briefly discussed. It is proposed to exclude from consideration cases of wilful misfeasance. A glance at the figures of certification complaints investigated by insurance committees suggests that such cases are relatively rare. The total number investigated by all committees in the British Isles from 1920 to 1923 was only 434, representing approximately one complaint for every 30,000 insured persons over a period of nearly four years; even in these cases the offence was sometimes trivial, and not infrequently the action of the doctor was upheld.

One fruitful source of trouble has been the attempt by the doctor to assist a patient in a technical difficulty. The certification rules definitely provide that:—

1. A First or Intermediate certificate need be issued only at the request of the patient.
2. A Final certificate, whether asked for or not, must be issued as soon as the patient is found to be fit to return to work; but it may not be issued if the patient has already returned to work.
3. All certificates must be given within 24 hours of the examination to which they relate.

Cases frequently arise where a patient neglects to ask for a first or intermediate certificate at the time of examination and subsequently (more than 24 hours later) applies for a certificate to produce to his society. Or a patient who has been receiving intermediate certificates may return to work without consulting his doctor and may subsequently ask for a final certificate. Hitherto the doctor has not, in such cases, been allowed to use one of the official forms, and he has had to choose between either writing out a special manuscript certificate or explanatory letter (probably resulting in further inquiries from the society) or refusing a certificate with possible loss of benefit to the patient. In these circumstances many doctors have felt themselves justified in using the regular form of certificate in "technical" breach of the regulations.

The voluntary certificate introduced last January meets these cases and, if properly used, should entirely remove this particular form of irregularity. The certificate states that the patient was examined on particular dates and was, in the doctor's opinion, incapable of work during a specified period. It is expressly intended for use where, through any action on the part of the insured person, the issue of one of the regular certificates is forbidden. It is issued at the doctor's discretion and the doctor is allowed to charge for its issue.

In future, therefore, a safe rule will be that in cases of doubt *due to the action of the patient* the voluntary certificate should be issued. Thus, the patient's interests are served by providing the society with the necessary evidence; the action taken on that evidence is, of course, a matter solely for the society. The voluntary certificate should not be used when the irregularity is due to the doctor's own action. For example, if the patient duly asks for a certificate at the time of examination, but the doctor, not having one at hand, neglects to send one within 24 hours, the regular form of certificate should be used, the actual dates of examination and of signing being entered.

Handy Certificate Books.

Complaints of irregular certification have, again, often arisen because the doctor had not the appropriate form to hand at the time of examination, and the writing of the certificate was afterwards delayed, perhaps through a succession of urgent calls. This has sometimes led to formal complaints of wilful retrospective certification. The difficulty is now largely removed by a more convenient printing and binding of the certificates. Excepting the voluntary and death certificates, which are printed separately, there are now only two forms; on one is printed the ordinary first, intermediate, and final certificates, while the other contains the special intermediate and convalescent certificates. Moreover, all the certificates, with the sole exception of the voluntary certificate, can be obtained bound in one book in suitable proportions; this book includes even the special notice to be given when intentionally vague certificates are issued. The doctor can, therefore, now conveniently carry a selection of every form of certificate required. Although the ordinary and special certificates are also issued separately in two books, the possession of a composite book by every doctor should prove of considerable convenience, particularly as an addition to his emergency kit.

Pressure by Societies.

There is ground for legitimate complaint that while the approved societies actively criticise irregular certification, they not infrequently, either directly or indirectly, themselves bring pressure to bear on the doctor to vary his normal certification practice. Sometimes the patient will press for a certificate which the doctor considers not to be regular, urging that it is being demanded by the society; sometimes the society's agent may press for certificates to be given on special days to accord with the society's paying-out time.

Coöperation between the doctor and the society is obviously desirable where it can be attained with due regard to the doctor's work and to the patient's interests. The sole discretion as to the withholding of a certificate or as to the date of a patient's examination rests, however, with the doctor, and it is believed that there would be a considerable improvement in the whole system of certification if the doctors more resolutely refused to issue certificates in circumstances of doubt until the doubtful point had been decided by the competent authority. The complaints so querulously voiced about certification irregularities on the part of doctors seem often to overlook the difficult position in which the doctor may be placed through irregularities on the part of the patient. It rests, however, largely with the doctors themselves to encourage a stricter observance of the regulations by the insured persons. The regional medical officers, the insurance committees, and the health insurance inspectors are the authorities available for deciding cases of doubt, and the maximum use should be made of their services. The patient who, in the doctor's opinion, improperly presses for a certificate should be referred for advice to the local inspector; while the doctor should seek the guidance of the insurance committee.

Diagnosis.

While societies have complained that the incapacitating cause is often not sufficiently indicated on the certificates, the profession have resented inquiry by societies into the adequacy of diagnosis. The certification rules, as the reader knows, provide that the incapacitating cause shall be stated as concisely as the doctor's knowledge of the patient's condition permits. On this point only two observations can here be made. Many societies have now formulated schemes for additional benefits, and those schemes sometimes provide for defraying the cost of certain special forms of treatment, which do not fall within the scope of medical benefit. It is, therefore, clearly to the patient's interest that the incapacitating illness should be shown with sufficient clearness to enable the society to consider whether the member should be assisted in obtaining special treatment. Further, now that the composite certificate books include the special notice to be given to societies when intentionally vague certificates are issued, the plea that the special form was not available can offer no excuse for the practice of "covering up" the real incapacitating cause by indicating some resulting condition—e.g., debility—just sufficiently to avoid "vagueness."

THE COÖRDINATION OF INTERNATIONAL RED CROSS ACTIVITIES.

IT will be remembered that the Eleventh International Red Cross Conference, held at Geneva in August, 1923, decided to appoint a commission to consider the international organisation of the Red Cross, and to submit a report on the subject, together with a draft statute, to the national Red Cross Societies. A conference composed of delegates to these societies was subsequently to be summoned to decide on the question of organisation. The difficulties to be solved arose from the existence side by side of two organisations, the International Red Cross Committee, formed in 1863, with its headquarters at Geneva, and the League of Red Cross Societies, formed in 1919, and established at Paris. These two organisations vainly endeavoured to arrive at an agreement; the matter was therefore placed before the conference which decided to make an attempt to deal with the difficulty by referring the question to the national societies. The commission of inquiry, formed in accordance with this decision, was composed of 15 members; 13 represented the national societies, whilst the remaining two represented the International Red Cross Committee and the League of Red Cross Societies.

The commission met for the first time at Brussels in November, 1923, when a general discussion took place. It appeared that the majority of the members were in favour of a solution whereby the harmonious working of the International Red Cross should be ensured by means of the practical coördination of its various services—a solution equally removed from the present overlapping existing between the International Red Cross Committee and the League of Red Cross Societies, and from the complete fusion of the two organisations. Ultimately the commission appointed a subcommittee composed of six of its members to prepare a draft statute for the International Red Cross, to be submitted to the commission at its next plenary meeting. This draft statute was prepared, and provided for the formation of a federation comprising both the national societies and the International Red Cross committee; it did not represent the unanimous opinion of the subcommittee, a counter-proposal being submitted by one of its members to the effect that all the international activities of the Red Cross should be in the hands of a single organisation, which should be a federation of the national societies, but not including the International Red Cross committee. The report of the subcommittee was placed on the agenda of the second meeting of the plenary commission, held in Paris at the end of January. At this meeting the efforts made to persuade the members unanimously to accept a compromise were unsuccessful. In these circumstances a vote was taken, the result of which was that the subcommittee's plan was adopted.

The commission will now submit to the national societies a report upon its work and the text of the draft statute adopted by a majority of its members, together with the counter-proposal and other suggestions submitted to it. Upon receipt of the remarks of the various societies in regard to these documents—which remarks should reach the secretariat of the commission before May 20th—the commission will once more meet for the preparation of its final report to the conference, with which the decision rests and which, according to a recommendation of the commission, should assemble in July next.

THE LANCET.

LONDON: SATURDAY, MARCH 1, 1924.

THE INCIDENCE OF RHEUMATIC DISEASES.[1]

A CONSIDERED study of the incidence of rheumatic diseases, founded upon records made by certain practitioners during the course of their practice among insured patients and collated by a committee of the medical staff of the Ministry of Health, has just been issued. It is the result of the first general and organised effort of insurance practitioners to undertake a group inquiry. If its importance on this ground receives less immediate recognition than it should, it will be because the matter, admirably presented, is of such absorbing interest as to exclude attention from the mechanism of its collection. The establishment of a uniform nomenclature, classification, and method of keeping records is the first requisite if any inquiry on rheumatic disease is to be kept within practical bounds, and the fact that so many groups of diseases are loosely packed together under the common label of rheumatism must have made this a formidable task. None of the existing systems of classification appeared to the committee or those who provided the records to be quite suitable, and quotations from the conflicting views on nomenclature of recognised authorities show that certain differences (such as on the need for distinction between osteo- and rheumatoid arthritis) are fundamental. Eventually, for the purpose of this inquiry, it was decided to classify into three main groups: (A) Acute rheumatism (rheumatic fever), together with subacute rheumatism; (B) non-articular manifestations of so-called "rheumatism" (muscular rheumatism, fibrositis, &c.); (C) diseases characterised by chronic joint change. These three groups were subdivided into nine categories, set out below, and the inquiry form on which observers were asked to record their findings contains also, for the less well-defined diseases, a note of the chief distinguishing signs and symptoms, so that the possibility of gross error in filling them up is practically excluded.

The inquiry had the great advantage, for statistical purposes, that the population at risk is known with reasonable accuracy, for the samples, taken from all parts of the country, may be regarded as typical anyhow of its insured population. The total number of rheumatic cases recorded was 2510 (1771 males and 739 females), which amounts to 27·6 per 1000 of the total population (approximately 91,000) under review. For every 1000 insured persons, each sex being considered separately, the incidence of diseases was approximately as follows: Group A, Rheumatic fever, M. 1, F. 2; subacute rheumatism, M. 3, F. 3. Group B, Muscular rheumatism, M. 6, F. 7; lumbago, M. 10, F. 3; sciatica or brachial neuritis, M. 3, F. 1. Group C, Rheumatoid arthritis (including infective peri-arthritis), M. 1, F. 3; osteo-arthritis, M. 3, F. 2; gout, M. 3, F. less than 0·1; unclassifiable chronic joint change, M. 1, F. less than 1. These figures must be considered in relation to the attack-rates for the various age-groups if their full significance is to be appreciated, and illustrative tables are furnished; it must be remembered that insured females have a much younger age-distribution than insured males. But the predominance of gout, and especially of lumbago, among males and the higher incidence of rheumatoid arthritis in females may well form the starting-point of further inquiries designed to throw light upon causation. The total length of sick absence attributable to rheumatic diseases amounts in males to one-sixth of the total sick absence due to all diseases, and in females to one-seventh. Joint diseases account for more than half of these enforced holidays, while it is noted that the comparatively small amount of sick absence shown as due to acute and subacute rheumatism constitutes only a fraction of the real amount of disability for which these varieties of rheumatism are ultimately responsible; for in this inquiry the sickness due to valvular disease of the heart unaccompanied during the year of record by rheumatic symptoms is not taken into account. The estimation of the financial loss involved is even more impressive than the attack-rates. If the sample of the general insured population is a fair one—and there is no reason to doubt this—it would seem that more than one-seventh of the total sick benefit, or over £1,800,000, is paid to, and 3,141,000 weeks of work are lost annually by insured workers on account of rheumatic diseases, excluding benefit paid or work lost on account of organic disease of the heart. This sum of wasted time and money, the proximate causes of which are further subdivided in the report, is in itself sufficient ground for the vigorous prosecution of research into causation and treatment urged by Sir GEORGE NEWMAN in his introduction to the report. It could not be expected that from this preliminary inquiry much of practical import in either of these directions would emerge, but even here certain indications, divided with nice precision into ascertained facts and impressions, are recognised. It is a fact, for example, that of patients with acute rheumatism nearly 50 per cent. had enlarged or septic tonsils and that only 2 per cent. had had their tonsils removed; it is an impression, derived from scrutiny of the records of the various forms of fibrositis, of the non-articular rheumatic manifestations, and of the chronic joint diseases, that dental sepsis may be a factor in ætiology.

As to future lines of research, sufficient geographical and occupational variations in the incidence of rheumatic diseases have come out of this inquiry to merit further investigation. Local variations in incidence of gout are especially noteworthy. As to preventive treatment, in the prophylaxis of valvular involvement the importance of arrangements for long rest during convalescence, so often emphasised in our columns, is brought out, and the traditional association of all varieties of rheumatism with damp houses is regarded as well founded; while the reduction in the incidence of acute rheumatism in this country and in America is attributed to the increased attention paid to tonsillar sepsis in school-children. Treatment, on the other hand—though Sir GEORGE NEWMAN believes that it is now beginning to enter upon a more hopeful phase—is admittedly unsatisfactory, especially in the chronic diseases. The establishment of arthritic hospitals or special clinics where treatment could be studied and the newer methods for the alleviation of symptoms tried out, is recommended. This recommendation will be endorsed by practitioners for two reasons. Not only would the concentration of patients suffering from rheumatic arthritis in the properly equipped institu-

[1] Reports on Public Health and Medical Subjects, No. 23, The Incidence of Rheumatic Diseases. H.M. Stationery Office. 1924. 2*s.* 6*d.*

tion have immense possibilities from the aspect of research, but such institutions would help to solve the problem of finding a place where these unfortnuate sufferers can be cared for.

There are many more points in this comprehensive survey of exceptional interest, and to these we shall have occasion to return. The report is a remarkable production and should silence for ever those who judge from the reluctance of the practitioner to fill up forms which he considers unnecessary his unwillingness to coöperate in a well-planned inquiry of limited scope.

BAYER "205."

EX AFRICA semper aliquid novi. There is something particularly stimulating in the discovery of a new drug and in the record of its success in such a particularly intractable and devastating disease as trypanosomiasis. It is therefore not unnatural that recent accounts of the therapeutic and prophylactic action of Bayer "205" in men, and to a certain extent in animals, has given rise to the hope of a brighter future for the Dark Continent. Were the great waterways of the Niger, the Congo, and the Zambesi free from this scourge, were life made possible for beasts of burden and pastures habitable for cattle, Africa might one day become the richest continent in the world. In his paper to the Royal Society of Tropical Medicine and Hygiene on Feb. 21st,[1] Prof. F. K. KLEINE gave a lucid and critical account of the action of Bayer "205" in Central Africa. Prof. KLEINE is one who believes little in speculations, but only in the results of well-planned experiments; he therefore deprecates, quite rightly, the idea that Bayer "205" is infallible for every form of trypanosomiasis. The methodical manner in which the therapeutic effects of this drug have been tested, first in animals, then in man, under his direction call for special praise even though Prof. KLEINE'S scientific reputation is firmly established.

In the discussion which followed Prof. KLEINE'S paper it became evident that the time for a systematic inquiry into many aspects of human trypanosomiasis has now arrived. As Prof. WARRINGTON YORKE pointed out, Great Britain, which has such large interests in Africa, has a natural responsibility to carry on the researches initiated by Prof. KLEINE on the Congo and in Northern Rhodesia; this should entail an accurate record over a number of years of the cases so far treated to ascertain the permanency of the cure. According to YORKE, the actual death-rate from human trypanosomiasis under natural conditions is unknown; there are areas in Southern Nigeria, for instance, where the trypanosome has become so attenuated as to be no longer pathogenic, while in other districts, as formerly in Uganda, the disease spreads like wildfire and causes a very high mortality. The factors which underlie these ascertained facts is unknown. The vexed question as to possibility of mechanical conveyance of trypanosomes by tsetse-flies, which YORKE and LYNDHURST DUKE believe to be possible—a view KLEINE vigorously opposes—should admit of an early solution. It may be necessary to study more minutely the life-cycle of the trypanosome in the peripheral blood, already outlined by Miss MURIEL ROBERTSON, for it is conceivable that in certain stages the organism becomes more vulnerable to the action of the drug. There is still much more to be learned about the dosage of Bayer "205," the reason of its action upon some pathogenic trypanosomes and inertness towards others—*Trypanosoma evansi*, for example—as well as of its mysterious attenuation of the virulence of *T. brucei* in cattle.

In animals repeatedly injected with Bayer "205" the trypanosomes soon develop a "fastness" towards this drug, and the same appears to take place with equal rapidity in man. In view of this fact the amount and spacing of the dosage becomes extremely important; KLEINE therefore suggests 2 g. as the initial dose given by the intravenous route and followed subsequently by three separate gramme doses at weekly intervals. Should, however, the trypanosomes return to the blood-stream in spite of this dosage they are then more susceptible to the action of some metallic drug, such as antimony tartrate or tryparsamide; the latter, according to Miss LOUISE PEARCE, of the Rockefeller Institute, has marked therapeutic properties, so that it is not improbable that by a combination or alternation of these drugs ultimate success in resistant cases may be achieved. Such an inquiry as we have suggested should envisage in its scope a comparative trial under similar conditions on an extended scale of these recent advances in the therapeutics of trypanosomiasis, and we would recommend such an investigation to the League of Nations so as to invest it with an international character. Certainly it is a subject of great economic importance; if mainly to the British Empire, it also concerns France and Belgium and, to a lesser extent, Portugal and Spain. Little information has been disclosed so far on the chemical composition or formula of "205." It is understood to be a complex organic aniline body, of which the nucleus is trypan-blue. We hope that in their own interests, as well as for the benefit of science, the manufacturers will soon be in a position to supply more detailed information on this point.

[1] See THE LANCET, Feb. 23rd, 1924, p. 384.

INSURANCE DENTAL BENEFIT.

THE position of "dental benefit" under the National Health Insurance Acts is not at present clearly understood either by the general public or by those members of approved societies who are entitled to participate in it. Dental benefit may be described as a statutory benefit, but it is not, like medical benefit, one to which every insured person is entitled. The only reference to dental treatment in the Act of 1911 is in Part II. of the Fourth Schedule, under "additional benefit," where of 14 specified benefits which might under certain circumstances become available to members of approved societies, No. 2 on the list provides for "the payment of the whole or any part of dental treatment." That any tangible gain would result from this provision was a contingency which few professional men in 1911 regarded as of any practical interest. Happily those members of the British Dental Association who saw the possibilities ahead managed by dint of perseverance to obtain in 1913 general approval by the dental profession of a scheme whereby dental treatment might be made available to the industrial classes on a uniform scale throughout the country. The scheme, in brief, provided for those persons coming under the wage-limit of the Insurance Act all the ordinary operations in dental surgery at agreed scales of fees by registered dentists grouped in voluntary panels. These panels were intended to cover the areas of counties, with subdivisions, where necessary, into district panels, and provision was also made for the formation of central committees in England, Scotland, and Ireland, which would coördinate and regulate the work of the local panels and conduct negotiations on behalf of the panels with Government departments or other bodies concerned. Although designed in anticipation of the valuation of the funds of approved societies in 1915,

the scheme was meant to be put in operation prior to that valuation and, in fact, public dental services were instituted in many parts of the country,[1] as, for example, in Bournemouth, Bristol, Brighton, Bedford, Birmingham, and Glasgow. The dentists joining the panel usually formed themselves into limited liability companies to facilitate administration. The war, unfortunately, interfered with the success of this effort—no profession having been more depleted by service with the forces than the dental profession—and in addition, the state of the law at that time permitted unregistered persons, either singly or in combination, to describe and advertise themselves as "Public Dental Services." Thus, an organisation voluntarily established by the profession, which promised to be of great benefit to the health of the community, fell largely into disuse.

The ultimate effect of the experience of the war on the attitude of the authorities and of the public generally towards dental service as an element in public health is well known. It produced first the Departmental Committee on the Dentists Act, 1878, appointed "to enquire into the extent and gravity of the evils of dental practice by persons not qualified under the Dentists Act." This Committee reported in 1919, and following upon that report the Dentists Act of 1921 was passed. When, therefore, the long-delayed valuations were at last completed, showing the existence of surplus funds in the hands of certain approved societies, dental treatment was offered by many of these societies as additional benefit to their members, and of all these benefits it has become that most in demand. In one society, for example, claims for dental treatment to the amount of £1500 per week are being passed. The number of approved societies and branches of these societies which include dental treatment among the additional benefits offered to their members is over 500, involving a membership of about 7 millions. Thus, as has been said, not all insured persons are entitled to the benefit, nor even all of the 7 millions stated, for of the members of the fortunate societies only those who have been continuously insured from a date not later than Dec. 31st, 1918, could claim the additional benefit resulting from the first valuation. The second valuation is expected to widen the possibilities, not only by the release of further surplus funds, but also by bringing into benefit those members of the societies who have qualified for benefit since the first valuation. In response to the demand thus arising, the scheme for industrial dental service already outlined was revived. The British Dental Association undertook the trouble and expense of putting it before all registered dentists by arranging meetings in all its branch areas over the country. In all these areas, 15 in number, public dental services were formed, and dental treatment at an agreed scale of fees on certain conditions was made available for the members of approved societies in every part of the country. Having organised the service, the Association by its constitution was unable to carry it on. The service was open to all registered dentists, and many of these dentists, particularly those registered by virtue of Section 3 of the Dentists Act, 1921, were not members of the Association. Therefore the Public Dental Service Association of Great Britain, Limited, was formed, of which all the local services already established became branches. This Association was registered as a limited liability company on Dec. 27th, 1922. Its registered office is in London and it controls the service through a central committee of representatives of all the branches. All registered dentists are eligible for membership. Its membership at present is over 5000 and is extending, as it is in the interests of all registered dentists who desire to participate in public work to join an association which can represent them and protect their interests when questions as to the interpretation of the conditions of service arise.

The whole question of public dental service is at present in an interesting stage. Dental treatment for members of approved societies—chiefly at present given as additional benefit—does not seem to fall under the description as "of the nature of medical benefit" and therefore does not come under the control of the insurance committees, but is administered by the approved societies concerned, subject to approval by the Insurance Department of the Ministry of Health of schemes drawn up by the societies. Questions as to conditions of service and remuneration had, therefore, in the circumstances, to be settled directly between the dentists and the approved societies, and there is at present in existence a joint committee of representatives of dentists and of approved societies for this purpose. The present arrangements must be regarded as temporary and in a measure experimental. The benefit of dental treatment is only reaching a comparatively small number of the persons requiring it, while, notwithstanding the publicity given to the matter, very many of those entitled to the benefit are ignorant of its existence or of the means of claiming it. Dr. H. S. Beadles has forcibly pointed out (see p. 475) how unfairly this uneven distribution of benefits works out in practice; territorial administration alone could give the desired relief. With dental benefit as it exists at present some beneficial results are apparent in a lessening of claims for sickness benefit in those ailments which can be most certainly associated with dental defects. It is certain that the methods by which the treatment is given are susceptible of great improvement, and would require serious modification in any scheme of permanent dental benefit which may be contemplated in the future. Above all, it is desirable that conservative and preventive treatment should be encouraged. Nothing could be more disastrous to the interests of public health than to dignify with the name of "benefit," and to encourage and perpetuate by the expenditure of public funds, the extraction of teeth and the insertion of artificial dentures which has been the chief dental treatment sought by the industrial classes hitherto. It is to be presumed that if and when that permanent dental benefit be instituted, as it seems destined to be, the methods applicable to medical benefit will be found applicable to the benefit given by the allied profession of dentistry. Presumably the promised Royal Commission on the National Health Insurance Acts will have this matter under consideration and the experience of the present service will be utilised by all parties concerned and not least by the dentists in suggesting methods for rendering available to the industrial classes in the future such a dental service as shall produce lasting and beneficial effect on the health of the community.

[1] See THE LANCET, 1917, i., 505.

MEDICINE AND THE EMPIRE EXHIBITION.

IN connexion with the British Empire Exhibition a committee of medical men has been formed with the object of welcoming their colleagues from the Dominions and Colonies visiting the metropolis. The Committee comprises the President of the Royal College of Physicians of London, the Vice-Chancellor of the University of London, and the Presidents of the Royal Society of Medicine, of the Medical Society of London, and of the various metropolitan medical societies. One of the first duties of this Committee will be to form an executive body and undertake the organisation of hospitality to be extended to medical practitioners from overseas. For this purpose it is desired to ascertain beforehand, as far as possible, the names of the intending visitors and the periods of their visits, and it is requested that intending visitors will communicate without delay to the hon. secretaries of the Hospitality Committee, Mr. Mortimer Woolf and Mr. E. T. C. Milligan, at 1, Wimpole-street, London, W. 1. A preliminary meeting of the Committee has been held, and the personnel will be duly announced. The Royal Society of Medicine, acting in coujunction with this Committee, will welcome all duly accredited members of the medical profession during their stay in the home country.

Annotations.

"Ne quid nimis."

AN INVESTIGATION OF CHILD LIFE.[1]

THE effect of maternal social conditions and of nutrition upon the weight and stature of the infant has been made the subject of an interesting and careful report to the Medical Research Council by Miss Bruce Murray. The general answer to the question generally proposed by the subject of the report is in the negative—the effect is small; but the findings are of high scientific value because the nature of the research and the material for investigation were both carefully defined. Only selected mothers and only certain infants were taken into consideration, and it is obvious that if the symbiosis thus arrived at displays little of the sad phenomena associated with the bad development of infancy that we see around us, it is because in the process of selecting the material the sinister factors have been eliminated. We are thus definitely assisted as to directions where remedies can be supplied.

Miss Bruce Murray, an Associate of the Institute of Hospital Almoners, has thoroughly investigated the records available at St. Thomas's Hospital and the General Lying-in Hospital, Lambeth, where notes have been kept of the social as well as the medical aspects of all the cases admitted for the last nine consecutive years, covering therefore pre-war, war, and post-war conditions. On the medical side full details were available concerning mother and child in the case-statements, including accurate records of measurements, while in the lady almoner's departments was found the information needed for correlation of the wages and social conditions of the family. These departments could place before the investigator case-papers showing every point in each patient's social circumstances throughout the last months of pregnancy and for some considerable time after confinement. Miss Murray, having digested the records, made house-to-house visits to many of the families, and then selected her material, so that the terms of reference in her report should be clear-cut. To avoid confusing the issue by such influences as size of the family or place of the infant in the family, only primiparæ are dealt with, and in this way the part played by maternal fatigue is omitted. All cases where maternal illness might affect the child, such as renal and cardiac disease, and, of course, syphilis and phthisis, have been excluded, as well as cases attended by the difficulties or abnormalities of labour complicated by eclampsia or ante-partum hæmorrhage. In this way a coördination of records has been possible which should definitely point to the effect which varying social and financial conditions have on birth-weight and birth-length. The classification of cases was then made, not according to social class, standard of living, total resources, or amount of rent paid, but the position of each case was decided by its expenditure, an average of net incomes being struck, when the cases were arranged in two classes above or below this average. The factors popularly supposed to affect birth-weight and birth-length were then found to exercise little influence. All mothers suffering from serious illness being excluded, it was seen that neither age nor stature in the mother played any determining part, while investigation of the season of birth pointed, though not definitely, to March as being a bad month of arrival. Comparison with material investigated at maternity homes presented difficulties, as, for example, the average age of the mothers was higher here than in the hospitals, nor was it possible to be certain that only infants would be included whose mothers were within the selected class of health. The general conclusion is arrived at that poverty, lack of proper nourishment, and generally unfavourable social circumstances during pregnancy do not produce the commonly accepted differences in the offsprings. As regards the hospital cases the averages for the war years showed no significant falling off in weight, though the average net income during two of those years was particularly low.

What is the positive finding of this interesting report? It is, as Dr. J. S. Fairbairn points out in his preface, quoting words also quoted by Miss Bruce Murray—"The fœtus lives like a true parasite, regardless of the expense to the mother." The whole document is a demand for the care of the parturient.

[1] The Effect of Maternal Social Conditions and Nutrition upon Birth-Weight and Birth-Length. A Report to the Medical Research Council. By M. Bruce Murray. London: H.M. Stationery Office. 1924. 1s.

THE LEPTOSPIRA ICTERO-HÆMORRHAGIÆ IN RATS.

THE recent epidemic of spirochætal jaundice occurring among miners in East Lothian has been the subject of investigation by the Scottish Board of Health, with the result that the disease is now locally notifiable. The question of the disease falling under the Workmen's Compensation Act was brought up in the House of Commons this week, but at present sufficient data as to its ætiology are not available to justify its inclusion under the terms of the Act. Epidemic infectious jaundice, an acute non-contagious disease characterised by fever, jaundice, hæmorrhages, and nephritis, occurring in epidemics or in localised groups, was first fully described by Weil in 1886, and in 1914 Inada and Ito discovered the causal organism to be *Leptospira* (=*Spirochæta*) *ictero-hæmorrhagiæ* This virus, according to Noguchi,[1] is a very minute organism, capable of passing through Berkefeld filters. Outside the human body it was first found to exist as a harmless parasite in the kidneys of field-mice by Miayima, and shortly afterwards, in 1916, Ido, Oki, Ito, and others discovered its presence in the rat, and their researches showed that the rat was responsible for human infection. The spirochæte is excreted in the rat's urine, and it is conceivable therefore that infection occurs as the result of exposure of the human being to soil on which the urine of these animals has been freshly deposited, or through the ingestion of food which has been left unprotected from such sources of infection. Animal experiments have shown that the organism is capable of penetrating the intact skin as well as the mucous membranes of the alimentary tract.[2]

In its geographical distribution the disease occurs in its most severe form in Japan, where it has been most widely investigated, but it occurs also in Central Europe, Southern France and Spain, and in the United States. In the recent war it made its appearance among the troops in the trenches on the various fronts; in October, 1916, Drs. L. Martin and A. Petit published an interesting note in the *Bulletin de l'Académie de Médecine* on the existence of the disease in the French Army, and in 1917 Drs. A. Stokes and J. A. Ryle contributed a full account of the infection in the British Army in Flanders to THE LANCET.[3] A case occurring in London was fully investigated and reported by Dr. P. Manson-Bahr[4] in 1922. Investigations carried out in all areas where the disease has manifested itself have established the common rat, *Mus decumanus*, as the chief carrier of infection. In the East Lothian outbreak live wild rats were obtained from the centre of infection, two from one of the coal-mines, and one from the surface at about a quarter of a mile from the pits, and examined by Dr. G. Buchanan.[5] Motile and characteristic leptospiral forms were found by dark-ground examination in emulsions made from the kidneys of the surface rat and one of the pit rats. No spirochætes were found in other organs, the urine,

[1] The Practice of Medicine in the Tropics, 1922. Byam and Archibald. Vol. ii., p. 1215.
[2] Noguchi: Ibid.
[3] THE LANCET, 1917, i., 142.
[4] Ibid., 1922, ii., 1056.
[5] Brit. Med. Jour., Feb. 23rd, 1924, 314.

or the blood. The blood was infected by *Trypanosoma lewisi*. The rats were well nourished and showed no sign of disease.

It is of interest to compare these results with the recent investigations of Profs. W. Schuffner and W. A. Kuenen into the condition of rats in Holland.[6] They examined, by dark-ground illumination, the kidney scrapings of a large number of rats in Amsterdam. Out of a total of 209 of the species *Mus decumanus*, 27 per cent. were found to be infected; of 29 of the species *Mus rattus*, only one contained the organism. They concluded that in comparison with other towns the percentage of infected rats in Amsterdam was fairly high, about equal to that of London (Stevenson). They also examined for *Trypanosoma lewisi* and found that 14 per cent. of the *Mus decumanus* and 7 per cent. of the *Mus rattus* were infected. In the case of old rats, the spirochætes were found in a much greater proportion of cases than among young rats (45 per cent. against 2·5 per cent.); the relative incidence of trypanosomes was 11 per cent. against 16 per cent. in young rats. Like Stevenson, they found the spirochætes in the kidney collected in foci, not in the kidney-substance but in the tubes. In the case of the rat the investigators hold that the infection gradually increases in virulence. Cases of Weil's disease in Holland are rare and the high infection percentage among rats came as a surprise to the investigators.

SECONDARY INFECTIONS IN PULMONARY TUBERCULOSIS.

Prof. Paul Courmont and Dr. Boissel,[7] of Lyons, state that until recently it was generally held that the tuberculous lung was almost always invaded at a certain stage of the disease by other organisms than the tubercle bacillus, and particularly by pyogenic germs. A considerable proportion of the patients' symptoms were attributed to secondary infection, especially the hectic fever and the aggravation of the general condition. The therapeutical consequences of this view were that mixed vaccines consisting of the principal pyogenic organisms were systematically employed in all cases of active pulmonary tuberculosis with frequently disastrous results. In opposition to this theory of the frequency of secondary infection Besançon and Biros, at the Strasbourg Congress in 1922, maintained that the tubercle bacillus played a predominant part throughout the course of pulmonary tuberculosis, and that the rôle of secondary invaders was reduced to a few cases of pneumococcal infection or insignificant bronchitis. The present writers carried out investigations on 188 patients presenting all varieties of pulmonary tuberculosis, and found that while secondary infections were much less frequent than was formerly supposed, they were present in a considerable proportion—viz., 20 per cent.—while in the remaining 80 per cent. the tubercle bacillus was sufficient to produce every form of anatomical lesion in the lungs and all the clinical varieties of the disease, including hectic fever. The secondary infections were divided into two groups. In the first group, which consisted of 13 cases, the infection was polymicrobial, there being a collection in more or less variable quantity of different organisms, such as streptococci, pneumococci, *B. coli*, and diphtheroid organisms. Cases of this kind were almost always very severe, with pulmonary cavities, and it was difficult to say whether these secondary infections merely represented the last stage of the disease, or whether they played a part in the evolution of the lesions. In the second group, which consisted of 23 cases, the associated infection was due to a single micro-organism, such as the pneumococcus (2 cases, 1 death), pneumobacillus (2 cases), enterococcus (1 case), streptococcus (3 cases, 1 death), tetragenus (2 cases, both fatal), *B. cutis commune* (4 cases, all fatal), catarrhalis (1 case, fatal), Pfeiffer's bacillus (5 cases, 1 death), and various cocci (3 cases). In the second group the secondary invaders appear to have played an important part. The prognosis indeed in many cases seemed to depend on the nature of the associated micro-organism. While the pneumobacillus and Pfeiffer's bacillus proved to be of little danger, the streptococcus, enterococcus, and tetragenus were found in the severe and rapidly fatal cases. A Paris thesis to which attention was drawn recently sets out the sinister relation of tetragenus to fatal tuberculosis. The practical outcome of the Lyons studies is that if vaccine treatment is to be employed in pulmonary tuberculosis it should be specific. In most cases vaccine treatment by other organisms than the tubercle bacillus is not required, but in cases of secondary infection vaccine-therapy should be tried, and is all the more likely to be successful when the tuberculous lesions are not severe or extensive.

[6] Nederl. Tidschrift voor Geneeskunde, 1923, ii., 2018.
[7] Paris Médical, Jan. 5th, 1924.

THE FUNCTIONAL CAPACITY OF THE LIVER.

WHILE the efforts of clinicians are continually directed towards the study of the functional capacity of diseased organs, the study of the hepatic functions has been somewhat neglected, although it is far more interesting and necessary than the mere physical condition of the liver. This state of things may be imputed to the fact that the results obtained have been at variance, often unexplainable and useless from a clinical point of view. Prof. Giuseppe Sabatini,[1] of the Institute of Clinical Medicine in the University of Rome, has published the results of his own investigations which seem to us to shed some light on the subject.

Prof. Sabatini recognises that the liver has not one, but five functions, the biligenetic, glycogenetic, ureopoietic, antitoxic, and proteopexic: he investigated them all by the usual well-known laboratory methods in 12 cases of hepatic disease, including diabetes mellitus, various forms of cirrhosis, jaundice, and gall-stones. In none of the cases were all the five functions affected simultaneously, nor was it possible to say whether in definite diseases there corresponded definite types of functional insufficiency either singly or gathered into special groups. In the case of cirrhosis this question could be with certainty answered in the negative, while the cases of diabetes showed an almost identical behaviour of the various functions. On the other hand, there was a profound and extensive disturbance of the hepatic functions in calculous cholecystitis. It must therefore be admitted that in this disease, apparently localised but which may cause grave disturbance of the general health, certain conditions come into play which seriously impair the action of the liver, perhaps through reflex nervous stimuli, and perhaps also through slight general infection. Investigations on a far larger scale and perseveringly carried out in this disease may help to solve this problem. The biliary function was always found altered in these patients to a slight extent, but in the diabetics it was normal, the glycogenic function was altered in some cases, normal in others—for example, in three out of four cases of cirrhosis it was found to be normal. The ureopoietic function gave results in accord with pathological conceptions; it was altered in three cases of true atrophic cirrhosis, and normal in a case of cardiac cirrhosis. In the diabetics there was invariably a disturbance of this function, probably in relation with altered metabolism not only of carbohydrates, but also of proteids. It is not improbable, however, that this function is altered in diabetics because there is in these patients a greater production of ammonia (a defence against acidosis) which necessarily changes the value of the coefficient of ureogenetic inadequacy. The proteopexic function, judged by the digestive hæmoclasis of Widal, did not give any definite or serviceable results, the hæmoclasis being sometimes positive and sometimes negative without reasonable

[1] Il Policlinico, Practical Section, xxxi., Jan. 14th, 1924.

explanation. The antitoxic function, at least in the form of Roger's induced glycuronuria showed a variable behaviour of no clinical value or particular interest for diagnosis.

The conclusion which may be derived from these interesting researches is that if it has hitherto been admitted that there is a parallelism of all the functions of the liver and a complete association between them, this view will have to be modified. Even assuming, according to the general laws of physiology, the harmony of the various hepatic functions, we have now evidence to show that this association is correct only within physiological limits. Under the action of different morbid conditions, the various functions, which perhaps have different anatomical sites in the complex and obscure architecture of the organ, do not all suffer simultaneously nor in an equal degree. So that we always find in functional exploration of the liver one or several functions more or less profoundly altered side by side with others which are absolutely normal and intact. Prof. Sabatini pleads for further studies of the many hepatic functions in order to arrive at an estimation of the functional efficiency of the organ by the adoption of definite and identical methods, so that results may be obtained which leave no gaps and are intelligible and comparable and lead to the determination of constant relationship between types of hepatic lesions and types of functional efficiency.

FUNDAMENTALS OF THE CANCER PROBLEM.

AT this stage of the cancer problem a critical selection from the enormous mass of material now collected, presented mainly in pictorial form, cannot fail to be of interest to students and practitioners. It is therefore not surprising that the Governors' Hall at St. Thomas's Hospital was filled with an audience of nearly 400 people on the occasion of the first of the four lectures on cancer being delivered under the auspices of the University of London by Dr. J. A. Murray. This lecture was a survey of the main features common to malignant growths, preliminary to the discussion of experimental and other research work in subsequent lectures. Dr. Murray's main conception of cancer is that of an aberration of the process of repair. Whether cancer arises in the covering epithelium of any portion of the body, whether it arises in the subcutaneous tissues, or from linings of the blood vessels, the same process is at work, the differences in the histology of the growth being due to differences in the tissues of origin. Dr. Murray showed lantern slides of primary and secondary growths in man and other mammals, and also in amphibians and fish, and of histological preparations demonstrating characteristic features of malignant growths. In a carcinoma which has developed from a glandular tissue the glandular structure is sometimes entirely lost, and a solid mass of cells results, but this differentiation can be reversed under suitable experimental conditions. Such a growth can be made to grow in a solid mass or made to return to glandular structure without having altered its characteristics as a growth. The superficial similarity between the histology of a carcinoma of the skin and of the development of an embryo has given rise to many of the now untenable hypotheses of the nature of carcinoma. In the early stages of malignant growths several foci of independent growth are to be found, and many growths have arisen by the coalescence of these foci; but it is interesting to note that this coalescence does not take place by the transformation of the intervening portions into cancer. It is on the interpretation of pictures as active processes—not as a final stage—that the diagnosis and interpretation of the histology of malignant new growths must rest. If cancer remained localised tissue there would be no necessity for the elaborate amount of investigation and study which we apply to it; very simple remedies would be sufficient, such as its removal when it became troublesome or dangerous. But it is the capacity for passing beyond the original site in the body and disseminating to the distant parts which makes cancer so serious a disease. Dr. Murray proceeded to discuss the occurrence and distribution of cancer. Here individual experience, he said, is of very little value. The experience of communities is required. Of all the causes of death, cancer is responsible for one-tenth or one-twelfth of the general mortality. Recoveries from cancer are practically negligible from the point of view of statistics in this country. The age-incidence of cancer, both in man and animals, is suggestive, for as we go up in years we find that the proportion of those dying from cancer, to the total of people living, rises swiftly. Comparison of the incidence and mortality of cancer in different countries is not easy. The difficulty is that we have no good grounds for believing that a number of cases of cancer recorded in any country represents truly the number of deaths in that country from cancer. There may be more deaths or fewer. There is no means of knowing what other diseases were termed cancer, or whether cancer was always diagnosed, and thus we have to read international statistics with a certain reservation. The significance of the apparent increase of cancer found in this and other countries is very difficult to interpret. It is extraordinary that the increase is not in those regions of the body—for example, cancer of the uterus—where the disease is commonest. Again, while females of 75 and upwards during the period 1851–1909 show progressive and rapid increase in the proportion of deaths due to cancer, in women of 35–45 the increase has been much less. Dr. Murray considers that we are justified in taking comfort from this observation by deducing that the factors which can produce cancer are apparently taking longer to produce it now than in the past. If the increase of cancer is significant at all, not merely due to improvement in diagnosis or the like, then it takes longer for the disease to develop than 40 years ago. That is one of the most hopeful features of otherwise ominous figures.

EPIDEMIC DROPSY IN CALCUTTA.

RECENTLY Calcutta has experienced an outbreak of epidemic dropsy, which has been the substance of an inquiry by the workers at the Calcutta School of Tropical Medicine, under Lieut.-Colonel J. W. Megaw and the staff of the Health Office, Calcutta. As a result of careful investigations, the ingestion of injured rice has been suspected as an ætiological factor in the outbreak. The disease first appeared among the women students of a medical school, who made their own messing arrangements. It was found that their rice supply came from a small dealer in a different locality. An interesting fact was discovered—namely, that the family of the dealer was suffering from generalised œdema, and that a number of people in the neighbourhood who obtained their rice from the same source were also affected. About 75 cases in all were detected. Colonel Megaw reports that all the effects which were observed went to show that the disease originated from the consumption of rice, and it was quite possible that one consignment of rice might have been responsible for all the cases. There have been many different views as to the nature and cause of epidemic dropsy.[1] In 1914, Lieut.-Colonel E. D. W. Greig, I.M.S., classified epidemic dropsy as one of the deficiency diseases, similar to beri-beri. It has also been regarded as an infectious malady, and in support of this view Dr. Bepin Brahmachari, I.M.S., has published a paper in a recent issue of the *Calcutta Medical Journal*.[2] Again, it has been widely held in Calcutta that a poison contained in an adulterated mustard oil is responsible for the condition, but no evidence of the presence of any poison has been obtained on scientific investigation. The opinion which now holds the field on the ætiology of epidemic dropsy is that rice which has been damaged by improper storage develops a mould which, when

[1] THE LANCET, 1920, ii., 1234.
[2] Calcutta Medical Journal, December, 1923, p, 519.

aken, acts as an intestinal irritant, and so affects he sympathetic nervous system. This view has been, n essentials, held by Colonel Megaw ever since he Calcutta outbreak of 1909, but conclusive proof as not yet been established. There are apparently reat practical difficulties in the way of subjecting amples of suspected rice to exact experiment. In ombating the present outbreak the Director of the School of Tropical Medicine recommends that rice should be cut out of the diet the moment symptoms of dropsy appear. In this way, it is believed, the course of the disease will always be arrested.

INSPECTORSHIPS UNDER THE BOARD OF CONTROL.

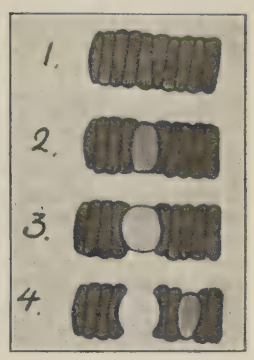
WE have before now commented upon the range—broad yet delicate—of duties carried out by the inspectors under the Board of Control (Lunacy and Mental Deficiency), and welcome the advertisement of the Board inviting applications for two more inspectors; but the terms of the advertisement, which will be found in our columns last week, have led to a representation being made to us upon two points. The words of the advertisement are :—

> The salary will be—
> (*a*) £500, rising by annual increments of £20 to £800 for men—and for women possessing a Medical qualification ;
> (*b*) £400, rising by annual increments of £20 to £650 for women.
>
> Bonus, which varies with the cost of living, is also allowed. Present bonus on salaries of £500 and £400 is £184 and £158 1*s.* respectively.
>
> The duties will include the Visitation and Inspection of Institutions, and candidates should possess a competent knowledge of the methods of Teaching, Training, and Managing Mental Defectives. A Medical qualification though not essential would be of value.

It has been pointed out to us that a differentiation in salary has been made between the sexes, and we agree that such differentiation in respect of public appointments in the medical world has now been generally condemned ; but the second point, to which more attention was drawn, is that it would appear that, for the male candidate for the post, a medical qualification, though regarded as an asset, is not to be an essential. The layman who, whatever his experience, will not have undergone a standardised course terminating in testimonials to the attainment of the standard, will be on the same footing as a candidate who has completed five or six years of intensive study. It will be agreed that many of the duties falling under visitation and inspection of institutions can be discharged by laymen, but it will not be obvious how a candidate is to prove experience in the management of mental defectives if he has had no special training in the phenomena of mental disease. The posts do not appear to us to carry a salary that will be attractive to medical men with special claims over and above a general medical training, which would seem to us to furnish a further reason for not minimising the scientific status to which they rightly attach importance.

A RE-DISCOVERED BLOOD CORPUSCLE.

Dr. Robin Fahraeus, whose work on the rate of sedimentation of the erythrocytes has given us a most valuable test of disordered metabolism, publishes in *Acta Medica Scandinavica* (1924, l., 12) an account of a blood corpuscle which modern works on the blood appear to ignore. This corpuscle seems to be a red corpuscle which has undergone hæmolysis, and, curiously enough, it is to be seen in every fresh preparation of blood, or, to be more accurate, its position is to be seen, for the corpuscle itself, having the same refractive index as the plasma, is invisible in this medium. In a strongly aggregating specimen of blood an isolated rouleau may be seen with a gap of quite the same appearance as the surrounding plasma. Yet the rouleau behaves mechanically as a coherent string, swaying to and fro with the currents in the preparation. The two corpuscles bounding this gap are curved inwards, although the last corpuscles at the two ends of the rouleau are convex outwards, owing to the surface-tension. The two concavities bordering the interval outline a sphere with a radius of about 3μ. These colourless corpuscles are more easily found in strongly aggregating blood than in blood of normal rouleau formation, and the obvious fact that they aggregate with the red corpuscles makes it probable that they are spherical "red" corpuscles without hæmoglobin. Similar bodies may be created by the artificial hæmolysis of the red corpuscles, a fresh preparation of blood being subjected to the heat of a strong source of light such as an electric arc lamp. Under these conditions a red corpuscle begins to change its appearance in the middle of a rouleau, swelling and becoming transformed from a disc into a sphere, turning more and more pale. This process is indicated in the accompanying diagram. When the corpuscle has become spherical there is only a trace of faint yellow left, and this fades away soon. In the case of the colourless corpuscle seen in an ordinary blood preparation it is not clear whether it represents an intravital process or not. Dr. Fahraeus favours the former view for various reasons, and he believes that this corpuscle represents the final stage in the life-history of the erythrocyte, of which we have hitherto been in ignorance. Though this corpuscle does not figure in modern works on the blood cells, it was long ago described by Dr. Richard Norris, professor of physiology at Birmingham, and the father of microphotography in hæmatology—a process he introduced in 1877. From a study of his photographs of fresh blood preparations he discovered a formed, colourless element of the same size as that of a red corpuscle. Almost at the same time Bizzozero published his classical discovery of the blood-platelets, and Norris at first thought that the two structures were identical. In his principal work, published in 1882, Norris described his corpuscles as the nuclei of the lymph cells which had lost their protoplasm and represented early stages of the red corpuscles into which the colourless discs were transformed by the absorption of red pigment. It will thus be seen that, though Dr. Fahraeus makes no priority claim to the discovery of this corpuscle, his opinion of its past, present, and future characteristics is very different from that of its original discoverer.



DIATHERMY IN ANTERIOR POLIOMYELITIS.

OF late years much stress has been laid on the importance of the relaxation and the prevention of stretching of paralysed muscles in cases of anterior poliomyelitis. And no doubt, rightly laid, although attention has thereby been diverted from the use of physical agents, other than massage, in the after treatment of this malady. The older forms of electrical treatment—viz., by the faradic and galvanic currents—are still sometimes applied, but they are prescribed solely for the purpose of causing the paralysed muscles to contract and undergo artificial exercise. Recently, Prof. H. Bordier, of Lyons, has remarked on the value of diathermy in infantile paralysis. It is well known that recovery from paralysis is greatly retarded by cold ; the heat generated by the diathermy current in its passage through the tissues is retained longer than the heat conducted to or radiated to the tissues from external sources. Heat from external sources does not cause a rise of temperature beneath the skin, whereas that produced by diathermy is actually generated within the tissues traversed by the current, both superficial and deep. Bordier states that the cold paralysed

limbs retain the heat produced in them by diathermy for long periods, amounting to 24 hours or more. He recommends the use of diathermy as a valuable aid in the treatment of the paralysed muscles in anterior poliomyelitis. In a lecture on this subject, delivered last week at the Hospital for Sick Children, Great Ormond-street, Dr. C. B. Heald gave particulars of four cases which improved considerably after the replacement by diathermy of other forms of physical treatment. The improvement was particularly evident in the condition of the limbs, the warmth being retained during the intervals between the applications of diathermy, while the power of voluntary movement was regained. Dr. Heald stated that he applied diathermy not only to the limbs, but also to the spinal cord in the region of the lesion, pointing out that this application to the spinal cord probably causes an increase of blood-supply to the site of the lesion. He quoted the statement of Ruhrah that the virus of poliomyelitis is destroyed by exposure for half an hour to 45° to 50° C., and suggested that the heat produced by diathermy in the spinal cord might lessen the toxicity of the virus.

THE SALARY OF THE ASSISTANT TUBERCULOSIS OFFICER.

WE have received some letters pointing out that the administrative county of East Suffolk, in an advertisement which appeared in our columns last week, does not offer to intending applicants the minimum salary according to the adopted scale. The wording of the advertisement was not clear to us, and we regret its insertion, but the letter warning us of its nature was not received until two days after we had gone to press. One of our correspondents reproaches us, also, in the matter of an advertisement for a temporary post of the same nature, but that advertisement was not accepted until we had ascertained that there was neither official nor local objection to its insertion.

THE ROYAL SOCIETY.

AMONG the 15 candidates selected by the Council of the Royal Society for election this year are Mr. Joseph Edwin Barnard, Dr. Mervyn Henry Gordon, and Prof. Charles Spearman. Mr. Barnard is honorary director of the Department of Applied Optics at the National Institute of Medical Research, and lecturer on microscopy at King's College, University of London. Dr. Gordon is consulting bacteriologist at St. Bartholomew's Hospital, and his name is particularly associated with the classification of different types of the streptococcus and the meningococcus, and with the investigation of filtrable viruses, particularly in relation to influenza. Prof. Spearman is Grote Professor of Mind and Logic in the University of London (University College), having previously been Reader in Experimental Psychology.

DONATIONS AND BEQUESTS.—By the will of the late Miss Matilda L. Putt, of Streatham, the testatrix left among other bequests £1000 each to the National Hospital for the Paralysed and Epileptic, Bloomsbury, and the British Home for Incurables, Streatham Common, S.W.; £500 each to the Torbay Hospital, Torquay, for the maintenance of the Bramford Speke Bed already given by her, the South Devon and East Cornwall Hospital, Plymouth, the Seamen's Hospital, Greenwich, Dr. Barnardo's Homes, and the Royal Society for the Prevention of Cruelty to Animals. The testatrix stated that in the event of any of the above hospitals, by reason of any Parliamentary legislation or other causes, ceasing to be supported by voluntary contributions, and managed by the State, or supported by the rates or grants from the State, the legacies to such institutions are to be void.—Among bequests left by the late Mr. John Greaves, of Manchester, are: £1000 to the Manchester Royal Infirmary; £250 to St. Mary's Hospital; £150 to the Hulme Infirmary; £500 each to the Manchester Children's Hospital and Dispensary, Pendleton and Henshaw's Blind Asylum; £200 each to the Manchester and Salford Blind Aid Society and the Salford Royal Hospital.—The Chelsea Hospital for Women has received a grant of £400 from the trustees of the Zunz Bequest towards the maintenance of its Annie Zunz Wards.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LX.—THE TREATMENT OF NEPHRITIS.

II.—ACUTE AND CHRONIC FORMS.

IN the light of the considerations advanced last week it is obvious that the general treatment of nephritis must depend largely on the nature of the case. In acute nephritis, treatment may to a large extent be guided by the severity of the condition, but in all subacute or chronic lesions the exact procedure to be adopted depends largely on the state of the renal function as revealed by the clinical condition and by renal tests. In all cases it goes without saying that every possible source of local infection should be explored, for a severe renal lesion may be the result of such conditions as chronic tonsilitis or a septic tooth. The general principles underlying the treatment of acute nephritis are as follows.

Acute Nephritis.

(1) Keep the patient absolutely at rest in bed; see that he is warm and suitably clothed, preferably with flannel next the skin. During examination by the doctor, great care should be taken to prevent undue exposure and chilling of the body. Give 2 gr. of calomel followed by a saline purge.

(2) Give a moderate amount of fluid, but no attempt should be made to give large amounts of fluid with a view to washing out toxins. For the first day or two, one pint *per diem* of fluid should not be exceeded if possible. The nature of the fluid does not matter much, and home-made lemonade, barley water, or very weak tea is suitable. If thirst is an important feature rather more fluid must be allowed.

(3) During the early acute stage the patient must be dieted just like any other case acutely ill. At first, it is best to give milk diluted one-third with soda-water, barley-water, or lime-water, but very soon bread and butter, Benger's food, and other starchy materials may be given. The nature and amount of food allowed must depend largely on the state of the patient's stomach and on the intensity of the symptoms. When the more acute condition has passed over the diet should be increased, and should consist largely of such articles as potatoes, rice, tapioca, bread and butter, custard, sweets, and cream. As improvement goes on fish should be added, soon to be followed by chicken and other meat proteins. In favourable cases a patient should be able to return to a more or less normal diet in about six to eight weeks. The addition of protein to the diet may be regulated by estimations of the blood-urea; as the blood-urea decreases towards the normal level the proteins may be increased.

(4) If œdema is severe, and the amount of urine passed continues to be very small, the condition may be helped by the use of such purgatives as pulv. jalap co., or, in young people, cascara sagrada or pulv. glycyrrhizæ co. Local pain may often be relieved by hot fomentations and poultices, or by these combined with cupping. Sweating may be induced by a hot-air bath or hot packs, or, if the patient is strong enough, by a hot-water bath. These baths should not last more than 20 minutes, as there is frequently some danger of cardiac collapse. During the process the pulse should be carefully watched; if faintness or collapse comes on the procedure must be stopped. If the œdema is intense, and the usual methods fail to relieve the condition, the administration of pilocarpine (1/10 to 1/6 gr.) is sometimes advocated, but its use is not devoid of danger, and it should only be employed under exceptional circumstances. Occasionally its use may set up œdema of the lungs, a most dangerous complication which may sometimes yields to the injection of 1/100 gr. of atropine. Hot air and other baths, though frequently

employed, are not often necessary, and it is doubtful to what extent they relieve the condition, but they often seem to make the patient feel more comfortable. If necessary, fluid must be removed from the limbs by the use of Southey's tubes, or from the body cavities by tapping. Southey's tubes should not be used except as a last resort, for they may give rise to sores which become infected and are difficult to heal. In extreme cases, decapsulation of the kidney has been resorted to; its value is very doubtful, though in a few cases dramatic results have been claimed. It is a procedure that cannot be recommended in acute renal lesions. Vomiting may be fairly severe in acute nephritis, and seems frequently to be largely dependent on the œdema and ascites. When this clears up the vomiting generally disappears. It is best treated by giving as little fluid as possible with the food, or, if very severe, by giving no food at all by mouth for a day or two. The usual alkaline remedies, especially when combined with small doses of hydrocyanic acid, are often very efficacious, and sometimes great relief is obtained by tapping the abdominal cavity and thus relieving the pressure of the fluid on the viscera. Drop doses of weak iodine tincture or of liquid carbolic acid given in water are occasionally useful. When vomiting is due to retained toxins it disappears when the kidneys regain their excreting power.

(5) Sometimes acute nephritis, especially when associated with marked œdema, gives rise to convulsions and a so-called uræmic state. Here the best treatment is the removal of 15 to 20 oz. of blood by venesection. Convulsions in acute nephritis generally cease as the result of this procedure, and the patient usually does quite well. Blood-letting is of much more value in acute nephritis than in the chronic condition, and probably might be more frequently practised than it is at present with benefit to the patient.

Chronic Nephritis.

The treatment of subacute or chronic nephritis resolves itself almost wholly into considerations of general régime and suitable diet. Complicated and puzzling as chronic nephritis may be from the clinical standpoint, modern research has shown that there are two quite distinct types of the disease, and that these two types can frequently be differentiated by renal tests.

The Hydræmic Type.—In one type the characteristic and prominent symptom is *œdema*; there is frequently a difficulty in excreting water and salt, but no difficulty whatever in excreting nitrogenous waste products. This hydræmic type is always associated with the presence of a very large amount of protein in the urine.

The Azotæmic Type.—In the other variety of renal disease there is frequently no hindrance to the passage of water and sodium chloride, but a distinct failure to excrete nitrogenous waste products. The urine in this azotæmic type frequently contains but a very small amount of protein; unlike the hydræmic variety, it shows a marked tendency to be accompanied by cardio-vascular complications, and sooner or later, if the patient survives, uræmic manifestations set in.

Before deciding on the line of treatment to be adopted in these different lesions it is essential to ascertain what the nature of the condition present in any patient really is. This information, as I have more fully explained elsewhere,[1] is best obtained by the use of modern renal tests. If a patient suffering from extreme renal œdema shows a favourable blood-urea concentration, and gives good results with the other tests, there can be no doubt that the best treatment is to put the patient on a good diet composed largely of protein. Often this increased diet may, with advantage, be combined with 10 to 15 g. of urea given by mouth twice daily. This dose may be kept up for a week, when it should be left off for a few days, to be continued at intervals for other short periods if necessary. It is wonderful how rapidly the œdema sometimes disappears with such treatment; in other cases one must admit that the results are disappointing, but when this is the case it will generally be found that the patient is not suffering from a pure hydræmic condition, but shows evidence of azotæmic or interstitial disease as well.

In hydræmic cases not very much can be done by means of hot air and other hot baths. In this type of case they are frequently dangerous, and cardiac failure, in my experience, is by no means a rare accident. They should never be used if there is any suspicion of cardiac weakness.

The diet in chronic interstitial nephritis must be guided by the extent of the lesion and by the state of the renal function. When the case is a very advanced one, the usual low protein diet is probably best, but in many patients experience shows that the present custom of prescribing a very low diet often does harm. In such patients a marked improvement in general health can frequently be brought about in a few weeks by allowing a good diet containing a fair amount of protein. No doubt the tendency to anæmia, so marked in many cases of renal disease, is frequently due to an insufficient diet, and probably more harm is done in the milder forms of nephritis by the poor diet alone than by the renal disease itself. On the whole, the tendency now is to feed our nephritic patients rather better than we did, and not to restrict protein too much unless the condition is really advanced.

Conclusion.

The various other therapeutic means employed in chronic nephritis are similar to those referred to when discussing the acute condition. The necessity for great care in guarding against cold and other deleterious influences is obvious. In the light of our present knowledge the factor which seems to play the largest part in the treatment of chronic nephritis is that of diet, and in all but extreme cases a good deal can frequently be done to contribute to the patient's comfort and welfare by the use of a suitable dietetic régime based on the principles outlined above.

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[1] Modern Methods in the Diagnosis and Treatment of Renal Disease. London: Constable and Co. 8*s.* 6*d.*

Special Articles.

VENEREAL DISEASE ABROAD.

The Impending Collapse of the Campaign in Germany.

A JUSTIFIABLY lugubrious account is given by Dr. Häffner[1] of the effect the present political crisis in Germany is having on the venereal disease campaign in general, and the dispensary system in particular. This state of affairs is the more deplorable as the dispensary organisation had become remarkably efficient towards the end of the war, and there was every hope that the control exercised by the dispensaries over individual patients would gradually be tightened. Now, according to Dr. Häffner, it is gradually being relaxed, and there seem to be well-grounded fears that the whole dispensary organisation may be dissolved, and patients in an infectious state will be more or less free to pass the disease on to others without much fear of detection. By 1919 there were as many as 138 dispensaries whose clientèle could be counted by the hundred thousand. In the Dortmund dispensary alone 3385 first examinations were made in 1922 and 5271 re-examinations. Courses of treatment were given in 4602 cases. In this and other German dispensaries an organisation was established to secure permanent supervision of the subjects of venereal disease for whom abortive and secondary courses of treatment were provided. It was anticipated that the

[1] Deut. med. Woch., Jan. 18th, 1924.

administration of the new venereal disease law would be mainly in the hands of the dispensary officials and that, as an effective weapon, the fate of the new law would depend on these dispensaries. Originally they were financed by local and central authorities and by the insurance societies. The central authority bore the lion's share of the expense, defraying most of the cost of examination and treatment, towards which the insurance societies also contributed a certain sum. But since 1920 the central authority has disowned one obligation after another, and the other parties to the financing of the dispensaries have also found it convenient to curtail their contributions. In 1923 it was decided in one area that the insurance societies must be entirely responsible for the treatment of their members, the central authority being prepared to provide only examinations and advice free of cost. The result of this decision has been that the insurance societies have failed in many cases to send their members to the dispensaries, being inclined to regard these dispensaries as too great a drain on the resources of the societies. Already about two-thirds of the patients in the Dortmund dispensary have been lost sight of for these reasons, and the time seems not far distant when this dispensary will have to be closed. Already in Baden the dispensaries have been closed, and doubtless the same fate awaits many of the other German dispensaries. When this state of affairs is compared with that which now exists in Great Britain, the points of similarity are striking enough to warrant the suspicion that it is not merely national bankruptcy that is responsible for the change. Post-war inertia and official lassitude are here counteracted by the activities of societies expressly devoted to keeping interest in this subject alive.

Infection Statistics in Switzerland.

The inquiry, conducted by the Swiss Society for Combating the Venereal Diseases, into the frequency of the venereal diseases in Switzerland is the subject of an interesting paper by Dr. W. Feld,[2] who points out that this inquiry covered the period October, 1920, to September, 1921, and that more than three-quarters of the Swiss doctors helped in the compilation of the statistics. Altogether 15,607 cases were thus notified, gonorrhœa being represented by 60 per cent., syphilis by 40 per cent., and ulcus molle by 0·6 per cent. There were four cases of venereal disease, recent or old, for every thousand inhabitants. Striking differences in the distribution of the disease in town and country were observed; only 15 per cent. of all the cases were bucolic. Three-quarters of all the patients lived in towns with a population of more than 10,000 inhabitants, and when to these towns smaller industrial centres were added, 85 per cent. of all the cases could be referred to town areas. In towns with a population exceeding 50,000 the incidence of venereal disease was 10·7 per 1000, whereas in small industrial centres it was only 2·5, and in country districts only 0·9 per 1000. The ratio of male to female patients was as 68 to 32, and among the new cases first diagnosed in the year under review there were as many as 75 males to every 25 females. There may be various reasons for these differences in the sex incidence of recent and old-standing cases; a comparatively great number of cases of gonorrhœa and syphilis in women probably escape detection till they are of old standing. About three-quarters of all the patients were in the twenties and thirties, and most of them were in the twenties. Classification of the patients according as they were single, married, widowed, or divorced brought out some curious facts. The divorced headed the list with 13 patients per 1000 inhabitants. The single came next with 7 per 1000, then the married with 3 per 1000, and finally the widowed with only 2 per 1000. But when the patients were classified with men and women in separate classes it was found that the incidence of venereal disease was higher among widowed men than married men—higher even than among single men between 40 and 49. But among the women the widows showed the lowest rate of infection. It is calculated that about 30 per 1000 of young men in the twenties living in large Swiss towns contract gonorrhœa every year, 5 to 10 per 1000 contracting syphilis in the same period. It is also calculated that there are about 37,000 persons in Switzerland who, at some time in their lives, have contracted syphilis. Of these about 8500 are undergoing treatment. There are also about 12,000 undergoing treatment for gonorrhœa, and every year there are about 100 new cases of general paralysis.

With regard to the mode of infection, Dr. Feld calculates that 80 per cent. of the married women traced it to their husbands, while 7 per cent. were infected before marriage, and 13 per cent. contracted venereal disease by extra-marital relations. Of the divorced women, 54 per cent. attributed their infection to their former husbands. In the case of the male patients, however, it was very exceptional for the husband to trace the disease to his wife; 40 per cent. traced it to prostitutes. It was found that the part played by prostitutes in spreading disease varied considerably with the different social classes; business men, clerks, and artisans were comparatively seldom infected by prostitutes, whereas the scientific professions, students, and waiters referred their infection in a comparatively great number of cases to prostitutes. About half the students had contracted venereal disease abroad. Though these figures do not, of course, include every case of venereal disease in Switzerland, they evidently give a very accurate picture of the comparative incidence of venereal disease under a variety of different conditions.

[2] Schweizerische Zeitschrift für Gesundheitspflege, 1924, iv., 105.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Edinburgh: Special Out-patient Clinics.

THE diabetic out-patient clinic recently started under Dr. Murray-Lyon makes the third of the special out-patient clinics now in operation at the Royal Infirmary, Edinburgh. The other two are for cases of lupus and for tuberculosis respectively. The lupus clinic, the father of them, was started by Sir Norman Walker in September, 1919. The scheme was conceived just before the war, but for obvious reasons it was not possible to get it thoroughly under way until after the war was over. The tuberculosis clinic was opened by Sir Robert Philip in October, 1921, with the assistance of Drs. Fergus Hewat and Jack Simpson, and is now under the charge of Dr. Hewat. The plan of working in all three clinics is largely on similar lines: the patients are seen in turn by the physician, progress noted, and necessary treatment carried out.

Lupus.—The lupus clinic has a roll of about 120 patients, with an average weekly attendance of about 40. An attendance roll is taken and patients must attend regularly, as instructed. Each patient is examined by the doctor, and changes in his condition are noted on his case-card along with any treatment carried out. About half the patients are being treated with tuberculin, and a number are now receiving Tungsten lamp treatment. The period of reporting varies from once a week to once every three months. Suitable arrangements are made for patients requiring hospital treatment and nursing or other medical attention.

Tuberculosis.—The tuberculosis clinic is run on very much the same lines. The cases are mostly children with abdominal tuberculosis and tuberculous glands. There are some 240 on the roll, and the average weekly attendance is 60. For diagnostic purposes each patient is rubbed with 10 per cent. Moro's ointment, and if this fails to produce a reaction 40 per cent. is used. The routine is as follows. Each patient is weighed. The weight is charted on his case-report, and he is then sent in with his case-report to the doctor for examination, and progress is noted. After this he is rubbed with Moro's ointment, beginning with 10 per cent. and working up to 40 per cent. The inunction is the only

pecific treatment, tuberculin injection not being sed. Instructions are given as to rest, exercise, diet, esh air, &c. Arrangements for sanatorium treatment re made for acute cases and for those whose progress ot considered satisfactory. The cases are all recommended by practitioners or from the wards of the nfirmary.

Diabetes.—The diabetic clinic resembles in general he other two. Although it has only been going a ew weeks there are already about 70 on the list, with n average weekly attendance of 30. Each patient rings a specimen of urine collected over 24 hours, hich is tested for sugar and acetone. The patients re then seen by the doctor, their progress or otherwise stimated, and the diets raised, lowered, or repeated as ay be required. The special diets, as suggested by r. Murray-Lyon, are used. Dietetic treatment is hiefly employed, insulin not being used except in ases previously investigated. Severe cases requiring nsulin treatment are put on the waiting list for dmission, and in the interim are put on dietetic égime, so that when they come to be admitted the ecessary time of in-patient treatment is materially ssened.

The advantage of this organised method of treating atients suffering from diseases requiring lengthy reatment lies in ensuring a concentrated study of he special disease, and in obtaining correct and ersistent treatment, which is so essential for satisactory results. The amount of time and labour saved s very considerable, the collecting of statistics is reatly facilitated, opportunities for mass experiments re afforded, and from the point of view of teaching he method offers many advantages. From the conomic and social standpoint it would seem to rovide the solution to the problem of dealing with hronic disease. The more effective treatment of hese conditions should materially lessen the amount f economic disability caused by them. At the ame time, from the teaching aspect it cannot be gnored that this scheme has the disadvantage of ithdrawing such cases from the ordinary out-patient lepartment, where the student is more likely to see hem, and necessitating his attendance at a number of pecial clinics which may be held at times which nake it difficult for him to attend.

Public Health Administration.

From the Scottish Board of Health comes the nnouncement of the loosening of governmental urse strings towards the public health services. A public health circular of February, 1921, imposed he restrictions (as stated in the Public Health ircular No. 1, 1921) on the development of grant-ided services, such as maternity and child welfare, uberculosis, venereal diseases, welfare of the blind, nd port sanitation have now been withdrawn. The oard will accordingly be prepared to consider on heir merits developments of these services which ppear to local authorities to be advisable and are ithin their powers. With the approval of Parliament, the Board will make grants for approved xpenditure on such developments at the rate applicable to the service and subject to the usual conditions. In regard to grant for the treatment of uberculosis, local authorities are informed that rant at the rate of 50 per cent. will be paid on all pproved expenditure incurred by them in the year 923–24, subject to the usual conditions. It is to be oped that these increased opportunities for advance ill be followed by correspondingly satisfactory esults.

ST. GILES'S HOMES FOR LEPERS IN ENGLAND.—his asylum, situated in a remote part of the country, the nly hospital for lepers in England, is at present struggling r want of sufficient funds. A generous donor has offered s. for every £1 that is collected up to £4000, and it is hoped hat the homes may benefit to the full extent of this offer. Donations may be sent to the Hon. Secretary, Mr. R. C. olton, 10, Old Jewry-chambers, London, E.C. 2.

Correspondence.

"Audi alteram partem."

INDUSTRY AND MEDICAL SERVICE.

To the Editor of THE LANCET.

SIR,—Factory law is a prominent part of public health legislation; it aims at preserving the health of the industrial population upon whose activity and productivity the community depends. We are right to be proud of our code of industrial legislation, which has been the model for similar legislation in all other countries; and the more we congratulate ourselves upon having been pioneers the more jealous we should be to remain in the front, but conditions in industry change rapidly, as has been shown in the series of articles, the last of which appeared in your issue of Feb. 23rd, and with industrial progression come new circumstances requiring new enactments. The subject is topical at the present moment, when a consolidating Factory Act may shortly be expected to be before Parliament.

Much has happened since 1901 when the present main Act was passed; supplementary Acts have been passed and new powers have been taken; experience gained in other countries has come to hand; a new spirit, bringing together employers and employed, has arisen in industry; new knowledge has been acquired and is still being acquired with regard to the economic value of the human machine; physiological laws underlying activity are being made manifest. There is to-day a greater tendency than in the last century for legislation to be based on the foundations of research rather than on special or immediate needs for remedying admitted evils. Medical research with regard to industrial activity has advanced, but so far the services of the medical profession have been but little used by industry—except in legal disputes for compensation claims. A staff of five medical inspectors of factories seems inadequate to control the health of some 7,000,000 factory workers, while the miners are left without any medical inspection. Truly there are certifying factory surgeons whose post was created as long ago as 1844; but their duties have not developed with the development of knowledge. Their main function to-day is to certify as fit for work young persons under 16 years of age; but as these young persons are not seen again, no chance is given for checking decisions; while for those employed in mines even this perfunctory supervision has never been established. Industry, familiar with these meagre duties, would appear to judge thereby the value of professional services, and to be content.

At present the post of certifying factory surgeon would seem to be of the nature of a vestigial remnant of historical interest, save where individual enthusiasts assume on high motives greater responsibility. The industrial doctor, practically unknown in this country, is well recognised in America where his services are appreciated to be an economic asset, and where there now exists a flourishing Association of Industrial Physicians and Surgeons. Doubt may be expressed as to the expediency of forcing a medical service upon industry by legislation; the relation of the State to its component parts cannot be summed up in the word "coercion." Nevertheless, obstacles in the way, such as the post for the certifying factory surgeon, should be removed and power might be taken, as in the case of welfare supervision, to call for medical supervision, which to commence with might be demanded for first-aid stations in large factories and subsequently be extended in the light of experience gained. Industry came into existence to provide health needs; these needs created industry. Industry should be, and indeed is, our greatest organisation for maintaining health; but it requires guidance.

I am, Sir, yours faithfully,

Cardiff, Feb. 19th, 1924. EDGAR L. COLLIS.

THE POSITION OF PSYCHO-ANALYSTS.

To the Editor of THE LANCET.

SIR,—The letter signed "A Teacher" in your issue of Feb. 23rd raises questions of interest even to those of us who have no direct concern with psycho-analysis. "A Teacher" implies that current methods of controversy are ethically unsound and intellectually incompetent. Both implications appear to me to be correct. Perhaps the ethical problem may be illustrated by a hypothetical case. The measurement and correction of errors of refraction are part of the ordinary work of medical practitioners, and retinoscopy is a method used by them. Errors of refraction are also treated by medically unqualified persons, and some of these, too, may possibly employ retinoscopy. If two Fellows of a College of Physicians of Surgeons wrote a treatise denouncing the evils wrought by persons termed retinoscopists but not otherwise specified, if the authors permitted that treatise to be reviewed in the daily press and subsequently wrote a letter in a daily paper containing further denunciations of retinoscopists, very few medical men would hesitate to describe the authors' conduct as grossly unethical. It is not clear to me that the substitution of the word psycho-analyst for retinoscopist and the consequent transformation of fiction into very recent fact alters the ethical position.

The intellectual incompetence of much Freud-supporting and Freud-demolishing printed matter—it cannot be termed literature—is obvious enough. Not to complicate matters, consider a single branch of the subject, that concerned with the interpretation of dreams. Some supporters of Freud's *Traum-deutung* almost appear to think that the method of Mr. Sherlock Holmes is scientifically adequate. It is, of course, mildly interesting when the Mr. Sherlock Holmes of real life deduces from the unbrushed condition of a hat that its owner's wife no longer loves him, and is able to say truthfully that the wife of the owner of the particular hat investigated really disliked the owner. But before we can attach great diagnostic value to the amount of dust upon hats in elucidating conjugal relations, we shall certainly need—dare I say—*statistics* of the distribution of many dusted and undusted hats in association with a distribution of wives loving and neglectful.

But the Sherlockian method, although not reasonable, has at least some affinity to reasoning. There is a lower deep. One may, for instance, set out the variety of symbolical interpretations which Freud and his adherents have assigned to the same or similar dream contents and assert that this variety *proves* what nonsense the whole business is. This enumerative process, sweetened by jokes of varying merit, is widely used. But its power as an instrument of research has not yet been fully appreciated. Thus it follows at once from the fact that in English the same word—e.g., box—means ten different things according to the context, that our mother tongue is mere gibberish. It is also quite plain that any man who pretends to effect the differential diagnosis of pneumonia and typhoid fever by purely clinical means is a quack, because Osler himself admits having brought a case before his class "one week as typical pneumonia, and a fortnight later shown the same case as undoubtedly one of typhoid fever." Much popular anti-Freudian writing is on this puerile level; but there is criticism which, while insufficient, is at least rational. We assess the value of diagnostic rules in bodily disease, sometimes by appeal to post-mortem verification, more often by the emergence, after the rule has been applied, of signs or symptoms which we deem crucial. What analogous tests are applicable to the Freudian rules? If I dream of ascending a moving staircase, how can I be sure that the meaning is erotic, how can I know that the "free associations" which, by all returning to a sexual *motif*, support that interpretation do not so return because I am unwittingly dragging them there, having read Freud's book? The answer is, of course, that I cannot be sure.

Two methods of rational examination have been suggested. A. v. Muralt[1] wrote down the dream of a patient and the "free associations" of the leading contents; he sent the transcript to a number of psycho-analysts, and invited them to interpret the dream and give a diagnosis. The author considered the concordance between the interpretations and the subsequent evolution of the case satisfactory. Another method is to do what Freud and de Sanctis (not a Freudian) have done, and what the late Dr. Rivers was doing—viz., record and study one's own dreams, not for a week or two, but for years. The collation of a large number of records might help us to reach, not the truth, but a field in which truth could be sought.

At present we are deluged with a flood of silly little books and articles the authors of which have made no independent investigations whatever, and frequently cannot even read the language in which much of the literature of the subject is published.

I am, Sir, yours faithfully,

Loughton, Feb. 24th, 1924. MAJOR GREENWOOD.

To the Editor of THE LANCET.

SIR,—When one finds in the same issue of THE LANCET Dr. Crichton Miller ranged on the side of those who urge that the study and treatment of emotional disorders should be approached from a physical point of view, and "A Teacher" who views the subject from the standpoint of orthodox medicine, advocating the serious consideration of the claim of psycho-analysis to full recognition as an essential factor in current medical science, the hope revives that the long overdue reconciliation between the dissociated halves of the science of healing may at last be within sight.

Dr. Miller, whose right to speak for psycho-therapy can hardly be questioned, disarms its opponents by seizing their weapons and himself attacking the position of those psycho-therapists who bring ridicule upon their profession by ignoring the physiological aspects of nervous disease. This he does with such vigour that he is moved to offer excuse for his attack, on the ground that "the therapeutic contribution of analytical psychology is too important and its possibilities too valuable to be exposed to criticism and even ridicule because of the apparent incapacity of certain analysts to correlate their psychological theory with physiological observation." Such criticism from such a critic will be welcomed by most level-headed psycho-therapists; yet the errors for which Dr. Miller flagellates his colleagues are such as occur very readily amid the dust of conflict. When the analyst who has first-hand evidence of the causation of hyperthyroidism by emotional stress is subjected to ridicule at the hands of endocrinologists and surgeons, who themselves have first-hand evidence of the causation of emotional stress by hyper-thyroidism, he very naturally resents the illogical intolerance of his opponents, and perhaps retorts that thyroidectomy in such cases should be and will be punishable as a criminal assault. The contestants on both sides fail to recognise clearly that they are dealing with a vicious circle. The therapeutic problem in every case involves the breaking of this circle at the point or points most accessible to attack. The ideal treatment may be a complete psycho-analysis; in practice this is usually impossible, and failing a sufficient measure of control by organo-therapy an honest psycho-therapist will invite the opinion of a surgeon as to the feasibility of a partial thyroidectomy.

But in the heat of conflict the psycho-analyst, like his opponents, too often adopts a self-sufficient and partisan attitude, and even Dr. Miller, in the very act of taking the lead in the direction of reconciling the rival claims, is not quite guiltless of setting them one

[1] Schw. Archiv f. Neurologie u. Psych., 1922, xi., 13.

gainst the other. But this is a minor criticism; he main point is that Dr. Miller, with an assured lace among the psycho-therapists, has opened the oor to a sane review of their methods from the point f view of general medicine, while "A Teacher" eads the way in equally sane criticism of their pponents as such. I am concerned to support ather than to criticise their action; for surely it is bvious that the conflict between the claims of the ody and the claims of the mind can be settled only y mutual acceptance and agreement. If the aterialist is able to establish some such position s that the mind is the sum of the conscious and otentially conscious reactions of the physical body, t does not follow that the mind is "nothing but" his. In ordinary human experience one mind can ave no traffic with another except by way of the nteractions of the corresponding physical bodies. t does not follow that there is no such thing as mind. gain, the fallacy of assuming that a thing ceases to e when it is analysed and understood is very revalent. An eminent endocrinologist addresses a neeting of psychologists and gives them much aluable and interesting information as to the unctions of the internal secretions; but he appears o expect them either to deny his contention that motional reactions are in large measure a function of nternal secretions, or to accept his corollary that the sychological study of emotional reactions is super-lous. Lest I should be judged guilty of that partisan ttitude which I deplore, let me add that psycho-nalysts appear to me to be equally liable to the bove-mentioned fallacy. They may, for instance, ell you that there is no such thing as a herd instinct, ecause they have been able to show that the reactions ncluded under this name have been built up from elf-preservation and sex instincts. But is this any roof that the herd instinct has no real existence? t might with equal reason be maintained that there s no such thing as a man, because his body is "nothing ut a colony of cells."

Physical and psychological schools alike have great eed of the recognition of the positive truths estab-ished by each other; their mutual negativism has asted too long, and it is devoutly to be hoped that it s nearing its end.

I am, Sir, yours faithfully,

J. NORMAN GLAISTER.

New Cavendish-street, W., Feb. 23rd, 1924.

SMALL-POX AND VACCINATION.

To the Editor of THE LANCET.

SIR,—In your issue of Feb. 16th there is a sentence n Dr. A. H. G. Burton's letter which has caught my ttention. He says "we are not quite sure whether he American type of small-pox breeds true." My rst case of small-pox was notified in Bentley-with-arksey U.D. on August 25th, 1922. I had then and or some time after the same doubt about the type f small-pox breeding true. Since the date in ques-ion up till Tuesday last there have been 185 cases otified in the districts of which I am medical officer f health. There have been no deaths.

I am quite sure this particular type of small-pox—all it American or what name you like—is small-ox, and breeds true to type. I may add that the resent outbreak of small-pox has interested me very uch, as it was my good fortune to be a resident edical officer at the City of Liverpool Fever Hospital, he Dingle, in 1902–03, when the hospital was emptied f scarlet fever and diphtheria and the whole 400 eds given up to small-pox. Speaking from memory, ver 2000 cases passed through the wards. The icture presented by many of the unvaccinated cases esembles those shown in the late Dr. Ricketts's ork on the "Diagnosis of Small-pox," Plates LIII., IV., and LVI. Small-pox of that epidemic left on ıy mind the indelible impression that it was, at any ate in the unvaccinated, both a "killing disease" nd a mutilating one to the survivors.

The type of small-pox we are now experiencing is neither a killing nor a mutilating one. This was brought home to me as early as Oct. 1st, 1922, when I was called into consultation and saw an unvaccinated father, aged 33, in bed with his unvaccinated infant, aged 3 months; both were covered with a small-pox rash of medium density. The infant had it worse than the father. Both recovered and came out of hospital on Nov. 3rd. The mother brought the child to see me on discharge, and it was with difficulty I could find any scars.

Another thing has struck me about the present type is that the history of the invasion is most important. The invasion is definite and severe. When a collier, in the pink of health, has to leave off work for a headache or backache, you may be sure that it is a "knock-out" one. The next thing is that the number and character of the individual lesions are often quite insignificant considering the severity of the initial symptoms. But the lesions occur in the classical positions if looked for, but they are often quite scanty even in the unvaccinated.

Lastly, a word about "bad arms." I have seen a good few in my own practice and that both of public vaccinators and private practitioners. They usually occur in adults. I have seen most successful results in families amongst the younger ones and "bad arms" amongst the elders when vaccinated at the same time with the same lymph. I draw attention to these facts as there is no use burking them. I impute no negligence to anyone, but of one thing I am sure, and that is that more revaccinations would be done amongst adults if the dread—for which there are some good grounds—of "bad arms" could be successfully met.

I am, Sir, yours faithfully,

A. B. DUNNE, M.B. Camb., D.P.H., &c.

Doncaster, Feb. 26th, 1924.

THE TRAINING OF THE OPHTHALMIC SURGEON.

To the Editor of THE LANCET.

SIR,—Ophthalmology is one of the most strictly scientific parts of medicine, being founded largely on physics, physiology, and pathology. Before a man begins practice as an ophthalmic surgeon he should have a fairly extensive training in physical and physiological laboratories. Up to the present time the General Medical Council, notwithstanding many a hint, has made no provision for the training and registration of ophthalmic practitioners. I put it bluntly when I say that any person who is rich enough to buy a case of trial lenses and test types can call himself an eye specialist. I know we have plenty of men in the United Kingdom who are worthy successors of Bowman and Nettleship, but there is nothing to distinguish them from the considerable number of practitioners who have never been either in a physical or physiological laboratory. The issues at stake are so important that the eye specialist should be trained just as extensively as is the specialist in public health.

I cannot attach much weight to the diplomas at present given in the United Kingdom. The course of study for these diplomas is not at all adequate. As an extreme example of what is possible: an eye specialist recently informed his readers that Maddox had announced the fact that the hypotenuse of a right-angled triangle is equal to the square root of the sum of the squares of the other two sides, and in the same contribution he said that Maddox had found that the angle between any two straight lines is given by the sine of the angle. Now a man who does not know the forty-seventh proposition of the first book of Euclid when he sees it and who does not know the trigonometrical functions of an ordinary right-angled triangle has never been a student in a physical laboratory and is quite incompetent to read the special parts of ophthalmic literature.

The danger that I see is this. There are a large number of opticians clamouring to be recog-

nised as eye specialists of a sort. Instead of having two months of study, as is required for some of the ophthalmic diplomas, these men have had perhaps two years, devoted almost entirely to the very important subject of the testing of refraction errors and of muscular errors. Personally I am opposed to registering these men as qualified ophthalmic practitioners. They certainly have received a better training in a very important sphere of ophthalmology than a good number of persons who are practising as ophthalmologists. The opticians referred to are agitating for registration. Ophthalmic surgeons may reasonably say that these opticians are not qualified; nor are they. But it is open to them to reply that there is no guarantee that ophthalmic surgeons are properly qualified. Probably these opticians have a much better training in the physics of vision than have a fair number of the eye specialists, and my objection to their being regarded as qualified to practise arises from the fact that muscular testing and refraction testing form only a small part of ophthalmic work. It does not take in the ordinary diseases of the eye, nor does it take in the important relationships between ophthalmology and neurology, nor the surgical work.

Personally I would regard any licensing of opticians to practise any part of ophthalmology as a public danger. At the same time I do acknowledge that a number of these opticians have, so far as theory is concerned, an excellent knowledge of optical work. There is a grave risk of their being recognised as ophthalmic practitioners, and so long as the General Medical Council tolerates the present state of affairs it seems to me that the opticians have a good case.

I am, Sir, yours faithfully,

Glasgow, Feb. 27th, 1924. FREELAND FERGUS.

DOCTORS AND ADVERTISING.

To the Editor of THE LANCET.

SIR,—Dr. Harold Spence's courageous, sane, practical, and humorous article under the above heading appearing in your issue of Feb. 23rd must, I think, express the opinion of the majority of medical practitioners. He satirises the convention which permits advertising through bulletins or news paragraphs, whilst discountenancing press references to medical men which appear to have no professional advertising value, and he claims a medical man's complete and unassailable right both legally and morally to secure publicity in certain ways, provided always that he is careful to preserve the rules of professional honour.

Dr. Spence draws attention to the unfortunate position in which the practitioner interested in the treatment of venereal disease finds himself, owing to the competition with free venereal clinics, where the financial position of the patient attending is not considered, and where the clinic is enabled to obtain that publicity which is denied the private practitioner.

The point which I wish to emphasise, however, is that the health and efficient medical service of the public is more important even than professional dignity. In the majority of diseases if a member of the public desires to have the opinion or treatment of a medical man especially experienced in the disease from which he suffers, he usually either follows the advice of his family doctor or of his friends in regard to the medical man he should consult. As regards venereal disease, however, the case is different, and he frequently carefully avoids his family doctor and is ashamed to ask his friends' advice. The usual reference works prove of little use to him as he does not know any name to look up, and does not feel inclined to wade through a long directory until he finds a name of a practitioner who appears to devote himself to this class of work. In many cases, therefore, he applies for information either to a venereal clinic or to a chemist as to whom he should consult, and it appears natural to presume that the advice tendered by institution or chemist would be influenced by personal association, and would not necessarily be in the best interests of the patient.

What seems to be desirable from the public point of view is such publicity as would be obtained in a carefully drawn-up register, copies of which would be easily accessible to the public, containing the various diseases or branches of medicine under different headings, and supplying details of practitioners claiming special experience in regard to such diseases. This register or directory could be drawn up by some competent authority and would contain the data, such as hospital or clinic appointments, publications, &c., on which the public would be able to form an opinion and arrive at a conclusion as to whom to consult. If some such register were widely advertised it would be a means of protecting the public and securing adequate publicity without advertisement for medical practitioners who have had special experience in certain branches of the profession.

Some of the existing books of reference could easily be adapted by adding a section in which practitioners' names were grouped under the diseases or branches of the profession in which they were interested, and their records could then be looked up in the preceding alphabetically arranged portion.

I am, Sir, yours faithfully,

H. WANSEY BAYLY.

Harley-street, W., Feb. 23rd, 1924.

LEPROSY: A SELF-HEALING DISEASE.

To the Editor of THE LANCET.

SIR,—In 1891 Dr. Kaurin showed me over the Leper Hospital at Molde, Norway, and drew my special attention to an apparently perfectly healthy young girl of about 23. He assured me that when she was first under his care she was a typical leper, but for some months all signs of the disease had left her, so that at the present time no one could have suspected that she had ever been a leper. I do not know the sequel, for on my next visit to Molde four years later I found, to my great regret, that the Leper Hospital there was closed.

I am, Sir, yours faithfully,

London, N.W., Feb. 23rd, 1924. LEONARD J. KIDD.

THE EXPLOITATION OF NURSES.

To the Editor of THE LANCET.

SIR,—The Chairman of the Finance Committee, General Nursing Council, seems satisfied that all is for the best in the best of all possible worlds for the nursing profession and the public. He rightly pleads that a fee of five guineas for *two* examinations is not excessive, but this does not alter the fact that every candidate will have to pay five guineas, and some will have to pay more if they fail to pass either examination on one or more occasions.

I am anxious to know what sort of standard the G.N.C. proposes to adopt. Will it be so high as to ensure the failure of a considerable number of candidates, and act as a deterrent to girls thinking of becoming nurses? Or will it be so low as to render the pretentious syllabus ludicrous and the examination a farce? Even a moderate percentage of rejections will have a tragical effect and a very low one will be comical.

My suggestion that the G.N.C. is anxious to obtain better and more expensive accommodation, like my other criticisms, is ignored. I note that a paragraph in the *Nursing Times*, Feb. 9th, states that the Council recently "turned down the house in Portland-place, evidently an attractive proposition." And there is no attempt to controvert my point that hard work for three years on a minimum salary and heavy fees for examination, with the possibility of rejection, will cause a deficiency in the supply of nurses. Certainly the policy of registration has not improved the quantity or quality of the girls entering our hospitals for training.

Seeing that registration is not compulsory and that the passing of a State examination is not essential to becoming a competent nurse, the G.N.C. is ill-advised

n creating the impression that their syllabus and xaminations will render registration difficult of ttainment. At present there are many partially rained nurses, some excellent, in private work. If hose now in training refuse to pay for the risks of xamination and are content with a certificate of three ears' full training at a general hospital, it is probable hat they would have little difficulty in obtaining work r would be inferior to registered nurses. I have heard uch grumbling from qualified and unqualified nurses n the lines of my former letter, but those who know he nursing world will understand the reluctance to xpress their views in print. As for their ability to xercise any influence by voting for representatives n the G.N.C., most of them know as little about ursing politics as about general politics. Even those ho voted in favour of registration were generally gnorant of what they were doing, signing because the atron or sister of the ward told them to. I do not now whether the G.N.C. publishes an audited balance-heet. Certainly registered nurses do not receive a opy and are in complete ignorance of the expenditure n this wretched farce, as well as knowing nothing of he general policy of their Council.

I am, Sir, yours faithfully,

Park-street, W., Feb. 25th, 1924. EDMUND CAUTLEY.

VARIATIONS IN SUSCEPTIBILITY TO INSULIN.

To the Editor of THE LANCET.

SIR,—In the course of an experimental research pon insulin, on which we have been engaged for some ime, we have found that the colour of the animals vith which we experimented had a very material nfluence upon their susceptibility, albino rabbits and nice being able to withstand without apparent harm n amount of the same preparation which proved apidly fatal to naturally coloured or piebald animals f a similar weight, whereas black rabbits and mice uickly succumbed to a dose from which naturally oloured or piebald animals recovered. The reason for his peculiarity is being investigated, and we hope hortly to publish our results in detail. Apart from heir theoretical interest these observations are of onsiderable importance seeing that the present nethod of standardising insulin is based solely upon ts physiological effects upon rabbits and mice. It is bvious that unless animals of the same colouring, as well as of standard weight and condition, are employed here may be considerable variation in the potency of he unit. It seems possible also that the different usceptibility of albino and self-coloured rabbits to nsulin may account for the apparent loss of potency f preparations sent from this country to the tropics. It has been stated, for instance, that four times the mount of insulin which reduced the blood-sugar of a abbit in England to 0·042 per cent. only reduced the lood-sugar to 0·062 per cent. in India,[1] but as we nderstand that the Himalayan rabbit with which the xperiments were probably carried out in India is a ink-eyed partial albino, the difference in these esults may have been due to that fact.

We are, Sir, yours faithfully,

P. J. CAMMIDGE.
London, Feb. 21st, 1924. H. A. H. HOWARD.

TREATMENT OF LIVER ABSCESS BY ASPIRATION.

To the Editor of THE LANCET.

SIR,—Dr. A. R. Neligan, in his article on this subject in your issue of Dec. 29th, 1923, refers to a paper of mine read before the Medical Section of the Asiatic Society of Bengal and published in the *Indian Medical Gazette* of March, 1914. As his reference to my paper gives a wrong impression, I shall be glad if you will permit me to correct it. In the first place, the series of 101 cases were all my personal ones, operated on in many different hospitals, not all in Bengal, and the case-histories were taken from my private case-book, not compiled from old hospital notes, thus ensuring a greater accuracy. Secondly, my earlier cases, beginning in 1900, were treated by incision and drainage, and these were followed by treatment by aspiration and the injection of quinine in the cavity, and the last set of cases were treated by aspiration alone, followed by the injection of emetine hypodermically immediately the aspiration was finished; the results of this last method being immeasurably superior to the old operation. I have therefore been a strong advocate of aspiration combined with the administration of emetine for many years. The subject being apparently still of some interest, I propose to publish shortly another series of 63 cases.

I am, Sir, yours faithfully,

E. OWEN THURSTON,
Lieutenant-Colonel, I.M.S.

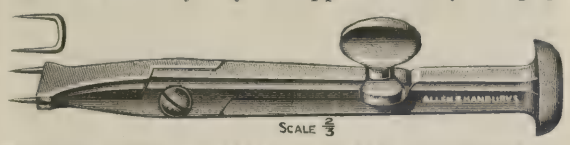
Chinsurah, Bengal, Jan. 29th, 1924.

[1] THE LANCET, Jan. 12th, 1924, p. 101.

STAPLE HOLDERS FOR ROUX'S OPERATION.

To the Editor of THE LANCET.

SIR,—I am interested in the description of a staple holder for use in the Roux operation for femoral hernia by Mr. A. MacLennan in your issue of Jan. 26th. Thirteen years ago a description of a similar instrument devised by myself appeared in your pages



(1911, ii., 1020). I think that this instrument has certain advantages over that proposed by Mr. MacLennan. The scissor form of the clamp ensures a firm grip of the staple and allows of its ready release after it has been hammered into place. The instrument was made for me by Messrs. Allen and Hanburys. I am, Sir, yours faithfully,

Harley-street, W., Feb. 14th, 1924. C. MAX PAGE.

The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt.-Comdr. E. W. Gandy is placed on retd. list with the rank of Surg. Comdr.

ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. Sir David Bruce, ret. pay, late R.A.M.C., is appointed Col. Comdt., vice Maj.-Gen. Sir Owen E. P. Lloyd, ret. pay, late R.A.M.C.

The undermentioned to be Lts. (on prob.): C. R. Christian, J. Huston, E. G. Dalziel, C. W. Greenaway, R. J. Rosie, M. A. Graham-Yooll, and L. F. O'Shaughnessy, from R.A.M.C., T.A. Gen. List.

The undermentioned Lts. are secd.: M. A. Graham-Yooll and L. F. O'Shaughnessy.

MILITIA.

Capt. J. A. Charles relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Capt. F. J. Whitelaw (late R.A.M.C.) to be Capt.

Capt. G. B. Brand to be Maj. (Prov.).

Supernumerary for service with the O.T.C.—Maj. A. E. Webb-Johnson ceases to be empld. with the London University Contingent, O.T.C.

Capt. (Local Maj.) T. B. Layton resigns his commn. and is granted the rank of Lt.-Col. with permission to wear the prescribed uniform.

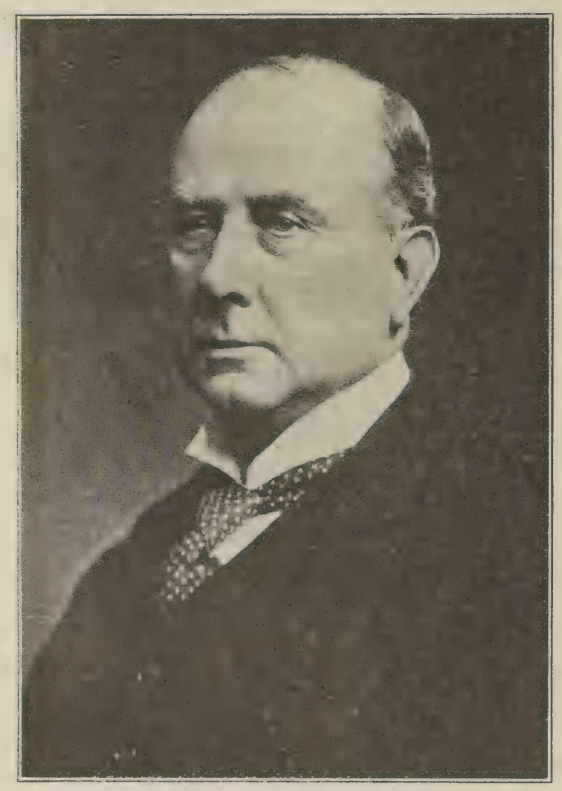
HONG-KONG UNIVERSITY. — The Rockefeller Foundation has allocated the sum of $250,000 to the University for the chairs of medicine and surgery. Hong-Kong University was founded in March, 1911, for British subjects, and degrees in arts, medicine, and engineering are conferred.

Obituary.

SIR MALCOLM ALEXANDER MORRIS, K.C.V.O., F.R.C.S. EDIN.

THE sudden death of Sir Malcolm Morris on Feb. 19th, at Bordighera, marks the passing of a man who, for upwards of half a century, fostered the progress of medical science in its widest aspects.

The fifteenth child and youngest son of Mr. John Carnac Morris, of the Madras Civil Service, he was born in Mansfield-street, Portland-place, in 1849. His medical student days were spent at St. Mary's Hospital, where, after qualifying M.R.C.S. at the age of 21, he served a year as house surgeon before taking up general practice in Yorkshire. He visited Berlin and Vienna, continued medical studies, and at the latter centre became interested in dermatology. On his return to England he was appointed clinical



[*Photo by Elliott and Fry.*

SIR MALCOLM MORRIS.

assistant at the Blackfriars Hospital for Diseases of the Skin, and later lecturer on dermatology at his old medical school attached to St. Mary's Hospital. He took the F.R.C.S. Edin. diploma in 1880, and in the same year became definitely surgeon-in-charge of the skin department at the hospital, and his work there for the next 20 years, both as a medical man and as an author and a public servant, undoubtedly served the institution well.

The study of dermatology at St. Mary's Hospital, and also at the Seamen's Hospital, Greenwich, where he was dermatologist, focused his attention almost from the first on the two great scourges of tuberculosis and syphilis, and during the full half century in which they claimed his attention and practical skill he saw the foundation laid for their eradication. Clinical and pathological work had been profuse in respect to both diseases, but the ætiology was unknown and the therapeutics were directed only to symptoms. The immense possibilities of Koch's discovery of the tubercle bacillus in 1882 at once appealed to Morris. No sooner had the discovery been proclaimed than he journeyed to Berlin and was privileged to witness the first demonstration by the great bacteriologist. One of the foremost amongst the supporters of Koch's theories in England, in 1899 he represented the National Association for the Prevention of Tuberculosis at the Congress in Berlin, and in 1901 he was secretary-general of the British Congress on Tuberculosis, the occasion on which Koch expressed his much criticised and since discredited views on the mutual relations of human and bovine tubercle bacilli. In the same year he visited the United States and delivered the Lane lectures in San Francisco.

The great attack on tuberculosis by the medical world was paralleled a decade later by the advance made against syphilis. In 1905 came the discovery of the spirochætes and following this discovery the modern treatment of syphilis. In 1913 Sir Malcolm Morris, realising the apathy in the public mind towards the disease and the general conspiracy of silence on the whole question, put forward a powerful appeal for the appointment of a Royal Commission on Venereal Diseases, and saw his proposals realised in the autumn of that year. He served on the Commission for the three years of its existence, and when the National Council for Combating Venereal Diseases was established in 1914, Morris was elected one of the vice-presidents. Here his views on prophylaxis were strenuously opposed to the indiscriminate dissemination of self-disinfection as a reliable measure of protection. In 1917 he published "The Nation's Health," as an effort directed to the stamping out of venereal disease, and written for the guidance of lay authorities.

As a dermatologist he enjoyed honorary or corresponding membership in many French, Italian, and American societies for the study of this subject, and was a past president of the Dermatological Section of the Royal Society of Medicine. In 1893 he served the office of president of the Harveian Society of London. He was also a member of the Committee of the Radium Institute. In 1894 he published a manual on "Diseases of the Skin," in which he gave in outline the principles and practice of dermatology. The work was considered as one of the best of the smaller text-books of the day, particularly in its practical aspects, although the author differed from current medical opinion on one or two points. A sixth edition of the book, considerably enlarged, was issued in 1917, a proof of the ever-growing value of Morris's contributions to his subject. He was one of the earliest to employ the Finsen light in the treatment of skin affections in this country, and in 1907, along with Dr. Ernest Dore, he gave a concise description of the practice of radiant method in "Light and X Ray Treatment of Skin Diseases." In 1908 the honour of knighthood was conferred on him, an honour which Sir Malcolm Morris chose to regard as a recognition of the position gained for dermatology as a branch of scientific medical study.

His activities and interest in other branches of public health were manifold. In 1917 he was elected president of the Institute of Hygiene. He was a fellow of the Royal Sanitary Institute, and chairman of the Federation of Medical and Allied Services. He was also a member of the International Council on Leprosy. In succession to his friend, Sir Henry Thompson, he was an advocate of cremation, and long served on the Council of the Cremation Society of Great Britain. In 1919 Morris published "The Story of English Public Health," a volume of an English Public Health Series, of which he was editor. In this book he gave a short history of the growth of the public health movement from the work of Edwin Chadwick, which culminated in the passing of the Public Health Act of 1848, down to the establishment of the Ministry of Health.

Sir Malcolm Morris, as writer and speaker, possessed great energy and facility of expression, and his interest in literature, in particular medical literature,

ook a practical form. At an early stage of his career e enlisted the interests of Messrs. Cassell and Co. ı medical publications, and in 1883 the firm published nder his editorship "The Book of Health," to be ollowed by two series of manuals, the one dealing ith physiology, pathology, and comparative anatomy, he other with clinical subjects, both of which met ith success. In 1886 he was co-editor with Dr. linis Hays, of Philadelphia, of the *International ournal of the Medical Sciences*, and from 1895 to 1902 e took over the editorship of the *Practitioner*, which e conducted with great journalistic ability. Later in fe he became a director of Cassells, Ltd.

In addition to his work for the *Practitioner* many f his contributions appeared in THE LANCET and ther medical journals. In 1921 he edited, in associa- on with Prof. F. Langmead and Dr. Gordon Holmes, "Dictionary of Practical Medicine," designed for he working practitioner, which contained in three olumes a symposium of the most modern advances ı medical knowledge.

Sir Malcolm Morris married Fanny, daughter of homas Cox, of Dorchester, Oxon, and in 1922 his olden wedding was celebrated by a congratulatory ıncheon at which a large group of personal and rofessional friends were present. On this occasion e told[1] of his early struggles in his attempt to make ood in London, and asserted that the secret of keeping oung was to have, to cultivate, and to preserve ıterest in public questions when that interest was irected towards the betterment of fellow men. He ved consistently up to his recipe.

ALEXANDER CHARLES O'SULLIVAN, M.B. DUB.

THE death, in his sixty-seventh year, of Dr. A. C.)'Sullivan, professor of pathology in the University f Dublin, which took place on Feb. 18th, is a serious)low to the cause of pathological research in Dublin. Ie was a remarkable and many-sided man, as his cademic career amply demonstrates. The elder son f the Rev. Denis O'Sullivan, rector of Macroom, o. Cork, he entered Trinity College, Dublin, in 1876 rom Dungannon Royal School. When he came up to he University he was equally proficient in classics and ı mathematics, but during his undergraduate course ecided to take up mathematics and philosophy for is degree. Having obtained a mathematical scholarship ı 1879 he graduated with the highest honours in 1881. Ie was a notable athlete, being a member of the Rugby ifteen and of the University eight. In later life he pent his holidays sailing and was a yachtsman of no ıean skill. Shortly after graduating he set himself to ead for Fellowship, which he won in 1886. In those ays the old system of examination for Fellowship ı all sorts of subjects was still in being, and O'Sullivan nswered brilliantly in mathematics and with distinc- ion in classics, an unusual combination. Acting on he advice of Dr. Samuel Haughton he decided to take ıp the medical profession, and having gone through he medical school while acting as a tutor Fellow, he ook his medical degrees and, obtaining leave from the)ollege authorities, he spent a couple of years at rankfurt and Vienna in pathological research. The chool of Pathology was created shortly after his)'Sullivan was appointed lecturer. It is not too ıuch to say O'Sullivan's appointment was the most mportant event in the modern history of the school. Ie brought a new spirit into the relations of teacher nd student. Inspired by his old teacher, Dr. John urser, then professor of physiology, he was almost ntirely responsible for the organisation of the new chool and for the repute in which it was held by he younger Dublin physicians. O'Sullivan was ı due course elected a Fellow of the Royal ollege of Physicians of Ireland, and he read many hort papers on pathological subjects before the cademy of Medicine and the Biological Club. areless of personal distinction, he did not publish his work, as his friends often entreated him to do, in the larger pathological journals, but his colleagues had the highest respect for his knowledge and his judgment in regard to pathological problems. He acted as consulting pathologist to one or two of the leading Dublin hospitals.

When the war broke out he took his full share, being appointed Major in the R.A.M.C., and proceeded to Malta, where in 1915–16 he did valuable work on the pathological side in the Army hospitals. He attained the rank of Lieut.-Colonel and was mentioned in despatches in 1917. He was afterwards consulting pathologist to the Irish Command. Recently his lectureship in pathology was constituted a full professorship. He fulfilled the duties of registrar to the School of Physic for the past five years, where his long acquaintance with the several aspects of college life made him specially valuable as a guide to and supporter of the traditions of the University which he loved and served so well.

A colleague at Trinity College, "J. H. B.," writes of him: "All through his working years O'Sullivan discharged to the full his academic duties as a Fellow, and he lectured and examined in arts as well as in pathology to the surprise of visitors to the University who were unacquainted with the old traditions of the College in virtue of which a Fellow was supposed to be able to turn his hand to anything. This antiquated tradition is now rapidly disappearing, but O'Sullivan was a remarkable illustration of its value in the case of really exceptional men. A man of science in the first place, he had wide classical culture, and to the end of his days he pursued the later developments of pure mathematics in his leisure hours. As the fruit of these labours he made several contributions to the mathematical discussions of the Royal Irish Academy. He was one of the most notable figures at Trinity College, and probably there was no one among the teaching staff who was regarded with so much affection by his many pupils and also by his colleagues."

Prof. O'Sullivan married Constance, daughter of the late Canon Whelan, and his widow, with two sons and two daughters, survives him.

ROBERT THOMSON, M.D., M.CH. RUI.

THE death occurred of Dr. R. Thomson, of Margate, surgeon and medical superintendent to the Margate Cottage Hospital, on Feb. 13th, in his sixty-third year. Dr. Thomson graduated M.A. of Queen's University, Belfast, in 1881, where, four years later, he took the medical degree of M.D., M.Ch., qualifying at the same time as L.M.R.C.P.I. In 1887 he entered general practice in Margate, first as assistant and shortly afterwards as a partner of the late Dr. Edward White. From his earliest years as a practitioner he came into touch with the clubs and friendly societies of the district, where by his able and unselfish work he won for himself a position of esteem and respect. He was appointed in 1897 to the surgical staff of the Margate Cottage Hospital, of which he later became medical superintendent. In 1915, in recognition of long years of devoted work, he was elected president, a position which he filled with ability and credit for a period of three years. During the war he was surgeon at Wanstead Military Hospital from 1914 until October, 1917. In 1922 ill-health necessitated the curtailment of his activities, but latterly he had recovered considerably, and his death from pneumonia came as a shock to his many friends.

A colleague, "A. G.-S.," sends the following appreciation: "For many years I had the honour of being closely associated with Dr. Thomson in work, both civil and military, and the mortality percentage with him was so low as to make one marvel. And he did a large amount of operating work, chiefly abdominal. As his anæsthetist for some 12 years I had the opportunity of witnessing his skill and extraordinary care in surgical procedures. Although in his later years Thomson's work was chiefly surgical, yet he was a very fine

[1] THE LANCET, 1922, ii., 207.

type of general practitioner. In medicine his opinion was sound, in gynæcology and midwifery he excelled, and in general and abdominal surgery he had few equals. Reserved as he was, few knew him intimately. But to those few his best characteristics were ever present—generosity, sympathy, a scrupulous care for the feelings of others, and an unswerving sense of friendship. Thomson solved many a difficult problem for a junior colleague; to the younger men he did all he could to help and advise, and by his patients he was revered and respected to a most unusual extent. Two years ago he was afflicted with severe prostatic trouble; just as he was getting well enough for the operation he so ardently desired he had a cerebral hæmorrhage. For 18 months he was condemned to a life of invalidism, and during this long time one never heard from him a single word of complaint. A broncho-pneumonia of a very toxic type ended the life of one who, delicate in physique, had a strength of character and courage under difficulties rarely seen."

Parliamentary Intelligence.

HOUSE OF COMMONS.

TUESDAY, FEB. 19TH.

Free Treatment of Venereal Disease.

Mr. SOMERVILLE HASTINGS asked the Minister of Health if he could give any estimate as to the result the provision of free treatment by the State had had on the incidence of venereal disease; and whether, if the result had been good, he intended to adopt similar methods for free treatment for other diseases.—Mr. WHEATLEY said: The information in my possession tends to show that the incidence of these diseases is declining, and that the provision of free treatment has undoubtedly contributed to that result. As my hon. friend is aware, there are certain features of these diseases which differentiate them from other communicable maladies, and which render the provision of free treatment especially desirable in the interests of the community. I could not undertake, within the limits of question and answer, to discuss the expediency of adopting similar methods for other diseases.

Hospital Accommodation.

Mr. SOMERVILLE HASTINGS asked the Minister of Health whether he could give the number of persons at present requiring treatment in the hospitals of London and unable to obtain it through lack of beds; and what he proposed to do to provide the necessary hospital accommodation for such people.—Mr. WHEATLEY said: No information is at present available, and considerable inquiry would be necessary to obtain even an approximate estimate. I propose, however, to ask the Voluntary Hospitals Commission to report on the extent of the additional accommodation required and the best means of providing it. The hon. Member is doubtless aware that provision of hospital beds is not within my statutory powers.

WEDNESDAY, FEB. 20TH.

Royal Commission on National Insurance Service.

Sir KINGSLEY WOOD asked the Prime Minister whether he proposed to advise the setting up of a Royal Commission to investigate the medical service under the National Insurance Act and kindred matters.—Lieut.-Colonel FREMANTLE asked the Minister of Health whether, seeing that a court of inquiry had recently estimated the value of the medical service under the national health insurance system, he would advise the appointment of a Royal Commission, as promised by his predecessor, to investigate the administration of national health insurance.—Mr. WHEATLEY (Minister of Health) replied: The Government propose to advise the setting up of a Royal Commission as soon as arrangements can conveniently be made to inquire into and make recommendations as to the whole system of national health insurance.

Sir KINGSLEY WOOD asked the Minister of Health the steps he proposed to take in connexion with the recommendation of the court of inquiry into the remuneration of medical practitioners on the panel.—Mr. WHEATLEY replied: The question of introducing the legislation required to give effect to the recommendations of the court of inquiry is now under consideration, and I am not yet in a position to make any statement.

Leprosy in the United Kingdom.

Mr. BECKER asked the Minister of Health the number of cases of leprosy notified in the United Kingdom during the last annual period; how many persons in the United Kingdom are suffering from leprosy; and for information as to the efficiency of the new cure for leprosy.—Mr. WHEATLEY replied: Leprosy is not compulsorily notifiable in this country, and the information available as to the number of persons suffering from this disease is only approximate. It is, however, known that the total number of cases in this country is very small, and during the past 25 years official records show that only 24 cases have been imported. As regards the last part of the question, the Secretary of State for India tells me that favourable reports are being received from that country regarding new methods of treatment, but it is not yet possible to say what proportion of cases can be cured.

The Influenza Outbreak.

Sir KINGSLEY WOOD asked the Minister of Health whether there was any indication of a falling off in the extent of the outbreak of influenza, and whether he was taking any special steps to deal with the outbreak.—Mr. WHEATLEY replied: I am advised that it is not possible to predict with certainty the course of the present outbreak of influenza, but there are indications that its maximum incidence will be reached shortly. The disease appears generally to be of a mild type, and it has not been considered necessary to take any special emergency measures.

General Nursing Council Rules.

Dr. CHAPPLE asked the Minister of Health whether he was aware that applicants for registration under the Nurses Registration Act, 1919, amended by a rule passed in July, 1923, had been rejected on the ground that their applications should have been lodged before July 14th, 1923; and whether he would take the opinion of the law officers of the Crown as to the legality of this action of the General Nursing Council.—Mr. WHEATLEY replied: I am advised that the Council have no power to admit applicants for registration as existing nurses after July 14th, 1923, and I see no necessity for consulting the law officers of the Crown.

Dr. CHAPPLE asked the Minister of Health whether he had evidence that many hospital-trained nurses had failed to register under the Nurses' Registration Act, 1919, because of neglect to send in applications within the period prescribed by the Act; and, if so, would he consider an amending Bill extending this period.—Mr. WHEATLEY replied: There is no evidence that any appreciable number of trained nurses who desired to be registered failed to apply during the two years' period allowed by the Act; and I see no necessity for amending legislation.

Dried Milk Regulations.

Mr. LAMB asked the Minister of Health the reasons which led his department to modify and postpone the operation of the Public Health (Dried Milk) Regulations; what was the nature of the objections to these regulations that were regarded by his department as confidential; and why the representative organisation of dairy farmers in England and Wales was not permitted to learn the nature of the objections taken to the original draft regulations.—Mr. WHEATLEY replied: The Public Health (Dried Milk) Regulations were published in draft form in July last with a view to eliciting any representations which might be made by parties concerned for consideration in my department. A number of representations dealing with points of detail were made on behalf of manufacturers and traders, and my predecessor was satisfied that it was possible to meet some of them without prejudicing the interests of the consuming public, and that it would be impracticable to bring the regulations into operation at the date originally suggested. I am not aware whether the representations made were intended to be regarded as confidential, but it was not considered that there was any ground for communicating representations submitted for the consideration of the department to other bodies.

Condensed Milk Regulations.

Mr. LAMB asked the Minister of Health whether he was aware that the customs authorities had no power to hold up consignments of imported condensed milk, the labelling of which did not conform to the Public Health (Condensed Milk) Regulations; and whether, since such improperly labelled milk might reach the consumer before the local authority concerned was in a position to take action, what steps he proposed to take in the matter to safeguard the public health.—Mr. WHEATLEY replied: The answer to the first part of the question is in the affirmative. The ultimate procedure for the enforcement of the regulations is by prosecution, involving the liability to a substantial fine, and I see no reason to suppose that the arrangements adopted for enforcement will prove to be inadequate to secure the object in view.

Deaths from Infantile Paralysis.

Mr. BECKER asked the Minister of Health the number of ildren under the age of 7 years who died of infantile paralysis ring the last 12 months; has his department any evidence owing that the high mortality amongst young children is e to the drinking of impure milk; and what steps does he opose to take to ensure a pure milk-supply.—Mr. HEATLEY replied: I can best answer the first part of the estion by giving the following provisional figures for aths during 1923 of children under 7 years of age, registered due to poliomyelitis and polioencephalitis: Polio-yelitis, 46; polioencephalitis, 20. The answer to the cond part of the question is in the negative.

Salaries of Health Visitors.

Mr. JOHN HARRIS asked the Minister of Health whether eing that the London District Council proposed that the laries for inspectors and health visitors in London should e for sanitary inspectors £190 per annum, rising to £300 er annum, and health visitors £150, rising to £250 per num, that his predecessor refused to agree to this scale, nd that the subject was left in abeyance, what action His ajesty's Government proposed to take in the matter.—r. WHEATLEY replied: I have arranged to discuss the atter with representatives of the London District Council.

Spirochætosis among Miners.

Mr. CLARKE asked the Minister of Health if he was aware nat a number of miners employed in East Lothian collieries ad been seized with a disease, diagnosed by a professor in the dinburgh Royal Infirmary as spirochætosis, a form of oison due to the presence of rats in the workings; and nat all of them were seriously ill and several had died from its ffects; and what steps was he taking to deal with the isease and the cause, which had created widespread alarm in ne district.—Mr. STEWART (Under-Secretary of Health for cotland) replied: The Scottish Board of Health are aware nat an outbreak of infective jaundice has occurred in ast and mid-Lothian; that the majority of those affected re miners; that within a year there have been 14 known ases, four of which resulted fatally. The bodies of three nts have been proved to be affected by the spirochætosis tero-hæmorrhagica. By regulations of the Board, dated eb. 4th, the disease has been made notifiable in the city of dinburgh and in East and mid-Lothian, including the urghs in these counties. The local authorities of the reas affected have the matter under observation, and the oard of Health are in communication with the Board of griculture and the Mines Department Inspectorate.

The Tuberculosis Order, 1914.

Sir HENRY WEBB asked the Minister of Health whether he ad reconsidered the decision of his predecessor as to the evival of the Tuberculosis Order of 1914; and, if so, when ne order would be put into operation.—Mr. BUXTON Minister of Agriculture) replied: I may explain that the uestion as to whether it is practicable to put into operation t the present time the Tuberculosis Order of 1914 is now nder consideration. I hope to be able to come to a decision n the matter at an early date.

Panel Patients in Public Institutions.

Mr. THURTLE asked the Minister of Health whether he ould take steps to amend the existing National Health nsurance Acts in such a way as to provide that when an nsured person was admitted to a public institution for reatment the panel practitioner responsible for the case hould be subjected to a reduction of his panel fee in respect f his failure to supply medical attention in accordance with is contract.—Mr. WHEATLEY replied: When an insured erson is under treatment in an institution with a selected nedical staff, which is not open to all general practitioners in he area, the obligation of the insurance practitioner to rovide treatment ceases for the time being. The hon. Member is under a misapprehension in suggesting that in uch cases there has been any failure on the practitioner's art to fulfil his contract, and I see no ground for reducing he capitation fee, in fixing which the limits of the obligation n regard to institutional treatment were taken into account.

Boards of Guardians and Insured Persons.

Mr. THURTLE asked the Minister of Health whether he as aware that, when persons insured under the National Health Insurance Acts were admitted to Poor-law hospitals or treatment, the boards of guardians concerned were precluded from receiving any benefits under these Acts in respect of the treatment so afforded; and whether he would take steps to have this restriction removed.—Mr. WHEATLEY replied: Boards of guardians have the ordinary powers of recovery of expenses incurred in providing treatment in a Poor-law hospital to a person insured under the National Health Insurance Acts, as in the case of all other persons for whom such treatment is provided. I do not think it either necessary or desirable that they should have any additional powers of recovery in the case of insured persons, and I would remind the hon. Member that any benefits to which such persons may be entitled under the National Health Insurance Acts are given in return for contributions compulsorily payable by themselves and their employers.

Houses Unfit for Habitation.

Mr. CECIL WILSON asked the Minister of Health the number of occupied houses which medical officers had reported as at present unfit for human habitation; how many persons were living in such houses; and the death-rate in regard to such houses.—Mr. WHEATLEY replied: According to statistics obtained from the reports of medical officers of health for the year 1922, 15,869 houses in England and Wales were found to be unfit for human habitation. Particulars are not available as to the number of persons living in these houses, or the death-rate in regard to such houses.

Suicide Statistics.

Mr. WRIGHT asked the Minister of Health if he could give the returns from the reports of the Registrar-General of the number of suicides per million of the population for each quinquennial period 1896–1900 to 1916–1920 inclusive.—Mr. WHEATLEY replied: The required figures for England and Wales are as follows:—

Period.	Rate per million population.
1896–1900	89
1901–1905	101
1906–1910	102
1911–1915	95
1916–1920	79

The figures given in respect of the years 1915–1918 relate only to civilian deaths and population.

THURSDAY, FEB. 21ST.

Ex-Service Men and Mental Disease.

Mr. PIELOU asked the Minister of Pensions if it was his intention to be responsible for the some 600 ex-Service men who were suffering from mental trouble who were at the moment under the care of the guardians.—Mr. F. O. ROBERTS replied: I assume that the hon. Member is referring to those ex-Service men for whose maintenance the responsibility of my department came to an end on Sept. 30th, 1922, under the expressed terms of Article 7 (2) of the Royal Warrant. The Government have decided to meet the charge for the maintenance from April 1st next of these men by means of a special exchequer grant which will not, however, fall on the vote of my department. I understand that Parliament will be asked to make the necessary provision in the votes of the Board of Control for England and Wales and General Board of Control for Scotland.

Pensions Medical Staff.

Mr. HOGGE asked the Minister of Pensions whether a large reduction of the medical staff of the Ministry was in contemplation; if so, on whose recommendation such reduction would be made; and whether he would consider withholding such reduction until the proposed departmental committee had considered the same and reported.—Mr. F. O. ROBERTS replied: Owing to the inevitable reduction of the work of my department, there is necessarily a corresponding decrease in the medical staff required. I am not contemplating any special reductions in the medical staff.

Lieut.-Colonel WATTS-MORGAN asked the Minister of Pensions the number of medical men employed at the Ministry headquarters in all grades in December, 1923; how many were over 60 years of age; and how many were engaged actually in the various theatres of war on active service.—Mr. F. O. ROBERTS replied: The number of medical men employed at Ministry headquarters on Dec. 31st last in all grades was 31, of whom three are over 60 years of age; 29 of these officers served during the war, 23 of them having served overseas.

The Use of Hashish.

Mr. GILBERT asked the Under-Secretary of State for the Home Department whether, seeing that hashish was not included in the list of dangerous drugs which were under restriction of importation into this country, he had any information of the use of this drug in certain seaport towns; and whether he proposed to take any steps to add this drug to the list of dangerous drugs and under the same restrictions as apply to them.—Mr. RHYS DAVIES replied: I have no information to show that indulgence in the use of hashish is anything but rare in this country, though it is possible it is practised to a certain extent among oriental seamen visiting our ports. Hashish is not one of the drugs to which the International Opium Convention of 1912 applies, though the Hague Conference recommended that its use should be investigated. Any proposal for the extension to hashish of the restrictions relating to the drugs included in the Convention would have to be considered from the international

standpoint, and I understand that the League of Nations, which by the Treaties of Peace is entrusted with the general supervision over the traffic in dangerous drugs, has not yet considered the question. The question is one in which other countries are more closely concerned than this country, but the position is being watched by my department, and, if it appears desirable, steps will be taken to raise the question before the Opium Advisory Committee of the League.

Supervision of Mentally Defective Children.

Lieut.-Colonel FREMANTLE asked the President of the Board of Education what steps, if any, were being taken for the supervision of mentally deficient children eligible for admission to special schools for whom accommodation in such schools was not available.—Mr. C. TREVELYAN replied: The board have been in consultation for some months past on this subject with representative bodies and persons concerned with the welfare of mentally defective children. They hope to issue a circular on the subject at an early date.

The Standard of Overcrowding.

Mr. ERNEST SIMON asked the Minister of Health whether, seeing that the standard of overcrowding generally adopted by medical officers of health was two persons per room, and that it was possible, without exceeding this standard, to have serious overcrowding and such conditions that elementary decency was impossible, he would instruct medical officers of health to adopt a new standard more in accordance with present-day opinion.—Mr. WHEATLEY replied: I am advised that the census figures as to families living under conditions of more than two persons per room have never been regarded by medical officers of health as other than a rough index of the prevalence and distribution of overcrowding conditions, and that there is general agreement among health officers that other considerations must be taken into account. As at present advised I do not think that any specific instruction to medical officers on this point is necessary or would serve any useful purpose.

Examination of School-children.

Mr. WINDSOR asked the President of the Board of Education if, in view of complaints received, he would issue instructions to medical officers that when examining school-children such examination should be in private, and that information with reference to the child's health and general condition should be private and confidential to the parents or guardian.—Mr. CHARLES TREVELYAN replied: It has been the consistent policy of the Board to insist that the medical inspection of school-children shall be conducted in private with the utmost regard for the feelings of the children and their parents. Moreover, in 1908, shortly after the inception of the School Medical Service, the Board instructed local education authorities that all entries of the results of inspection in each individual case must be regarded as confidential, and this instruction has been in force ever since. I am not aware of any complaints in this connexion, but I shall be quite ready to inquire into any cases in which it is alleged that the practice advocated by the Board has not been followed.

Cost of Relief.

Mr. CECIL WILSON asked the Minister of Health whether he could state for the years 1913–14 and 1922–23 the average cost per head of children in children's homes and children boarded out; the average cost per head of indoor relief in the case of the aged, the sick, the able-bodied, and the insane; and the average cost per head in asylums.—Mr. WHEATLEY replied: The average weekly cost per head in 1922–23 of children in separate establishments for children in England and Wales in respect of in-maintenance—i.e., for food, clothing, and necessaries, but excluding the cost of officers' salaries and rations, buildings, and loan charges—was, in those institutions for which separate accounts were kept, 8*s.* 8¼*d.* The average weekly cost per head of children boarded out in the same year was 10*s.* 9*d.* I regret that similar figures are not available for the year 1913–14. The average cost per head of indoor relief in the case of the aged, the sick, the able-bodied, and the insane, cannot be given separately for either of the years in question, but the average weekly cost per head for all classes of persons receiving indoor relief was, in the year 1913–14, 13*s.* 2¾*d.*, and in the year 1921–22, 31*s.* 0¾*d.* The average weekly cost per head for maintenance of patients in county and county borough mental hospitals in England and Wales was for the year 1913–14, 10*s.* 9½*d.*, and for the year 1922–23, 23*s.* 9½*d.*

FRIDAY, FEB. 22ND.

Machine-skimmed Milk for Infants.

Commander BELLAIRS asked the Minister of Health, in view of the danger to infant welfare from the unfit food that was imported as machine-skimmed milk, whether he would consider proposals to prohibit the import by imposing a minimum fat standard.—Mr. WHEATLEY replied: Under the Public Health (Condensed Milk) Regulations, 1923, condensed machine-skimmed milk is required to be labelled as "unfit for babies." I see no reason for prohibiting its importation as I am advised that, though the removal of fat renders it unsuitable for feeding babies, it is not an unwholesome food and may properly be included in mixed dietaries.

MONDAY, FEB. 25TH.

Plight of the Hospitals.

Mr. MARCH asked the Minister of Health whether his attention had been called to the straitened circumstances of many hospitals; and whether he was prepared to introduce a comprehensive health system on a national basis, in order to cope with the demand for treatment and remove the need for charitable support.—Mr. A. GREENWOOD replied: The position of the voluntary hospitals, though it is still difficult, has greatly improved since the report of Lord Cave's Committee. The proposal contained in the second part of the question is one with which my right hon. friend has some sympathy, but it raises far-reaching issues, both medical and financial, and he is not at present prepared to give any undertaking as to it.

Industrial Diseases.

Mr. CLARKE asked the Minister of Health if, in view of the fact that spirochætosis ictero-hæmorrhagica had now been made a notifiable disease by regulation of the Board, he would consider the advisability of having it included under the industrial diseases clause of the Compensation Act.—Mr. RHYS DAVIES (Under-Secretary to the Home Office, who replied), said: I understand that this disease is not notifiable in England, but that as a result of a recent outbreak in East Lothian it has been made notifiable in Scotland by an Order of the Scottish Board of Health. Before the disease can be scheduled under the Workmen's Compensation Act it must be shown to be due to the nature of some employment, and to be so specific to that employment that its origin can be established in individual cases. On my present information the disease in question would not appear to come within this category, but I shall be prepared to consider the point further when I have obtained a fuller report.

TUESDAY, FEB. 26TH.

National Insurance.

Lord HENRY CAVENDISH-BENTINCK asked the Prime Minister whether he was prepared to extend the terms of reference of the promised Royal Commission on National Health Insurance to cover the whole field of a general social insurance, designed to provide security to the worker and his dependents in cases of industrial accidents, industrial diseases, non-industrial accidents, ill-health, maternity, unemployment, old age, blindness, burial, unprovided widowhood, and unprovided orphanhood.—Mr. CLYNES replied: I do not think it would be desirable to extend the terms of reference of the proposed Royal Commission in the manner suggested by the noble lord. There is ample material for investigation within the limits proposed. The better coördination of the various social services is a separate matter which is receiving consideration.

Poor-law Vaccination.

Mr. BROMFIELD asked the Minister of Health if he would state what was the cause of the increase in expenditure on vaccination by Poor-law authorities in England and Wales during the year 1920–21 as compared with the previous year, the respective figures being £174,927 and £124,018.—Mr. A. GREENWOOD replied: The increase in expenditure on vaccination by Poor-law authorities during the year 1920–21, as compared with the previous year, was mainly due to the increase in the number of births and the consequent increase in the number of children vaccinated by public vaccinators during 1920 as compared with 1919.

THE HOSPITAL SYSTEM OF DUBLIN.—The President of the Royal College of Surgeons in Ireland (Sir W. I. de C. Wheeler), in a speech at a public dinner last week, made some severe criticisms on the Dublin hospital system. It was probably, he said, the worst in the world. There were 12 or 14 small hospitals, many of them built 200 or 300 years ago, and used in the heart of the slums, in the worst possible situation as far as the sick were concerned. If he had had any influence with the contending parties a few years ago, he would have asked them to give time to remove the patients and then to blow up the hospitals. It would have been a real benefit to Ireland, and new buildings on the Edinburgh system, would have cost only about half a million. Our Dublin correspondent adds: Though most thoughtful people will agree that the needs of Dublin could be better served by one or two large hospitals than by 12 small ones, nevertheless the President's strictures appear somewhat severe. Of hospitals, as of forms of government, it is sometimes true that "whatever is best administered is best."

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated :—

Surgery.—R. D. Jones, Edinburgh ; W. McLaren, Durham ; and H. J. Powell, St. Mary's Hosp.

Medicine.—J. B. Sweet, Glasgow.

Forensic Medicine.—R. Caplan, Glasgow ; L. K. Htoe, London ; E. G. R. Mac Mahon, St. Thomas's Hosp. ; M. S. Mahmud, St. Mary's Hosp. ; W. McLaren, Durham ; I. Morgan, St. Mary's Hosp. ; and A. M. Shawket, Liverpool.

Midwifery.—R. Hare, St. Mary's Hosp. ; F. James and R. Schofield, Guy's Hosp. ; and R. D. Marett Tims, Cambridge and St. Thomas's Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery : R. Caplan, M. S. Mahmud, W. McLaren, H. J. Powell, and J. B. Sweet.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At the Council meeting held on Feb. 14th the diploma of Member was granted to the following candidates who have passed the requisite examinations and have complied with the by-laws :—

R. D. Alexander, Cambridge and St. Thomas's ; C. F. Ashby, St. Bart.'s ; J. Atkin, Guy's ; N. F. Azer, Cairo and Charing Cross ; R. C. Baxter, Charing Cross ; H. P. Baylis, Guy's ; J. Bee, London ; E. R. Bennion, Westminster ; Muriel E. Binns, Royal Free ; C. E. W. Bower, Manchester ; M. A. B. Brito-Mutunayagam, Ceylon and St. Thomas's ; W. Brockbank, Cambridge and Manchester ; R. W. Brookfield, Liverpool ; W. G. S. Brown, Cambridge and St. Bart.'s ; R. E. D. Cargill, Oxford and St. Bart.'s ; H. D. Chalke and J. H. H. Chataway, St. Bart.'s ; Nora Cheney, King's Coll. ; R. Chester, Leeds ; W. Clark, Charing Cross ; G. D. Clarke, London ; R. G. Cochrane and T. S. Cochrane, St. Bart.'s ; P. S. Connan, King's Coll. ; A. M. Cooke, Oxford and St. Thomas's ; Rosemary Cooke, Cambridge and Charing Cross ; S. S. Cruden, St. Bart.'s ; D. E. Cuffey, Cambridge and King's Coll. ; E. R. Cullinan, St. Bart.'s ; Vera Cullwick, Birmingham ; C. H. C. Dalton, Cambridge and St. Bart.'s ; A. F. D. Darlington, Cambridge and St. Thomas's ; A. B. Davies, Guy's ; J. H. T. Davies and P. O. Davies, Cambridge and St. Bart.'s ; T. Davies, St. Bart.'s ; Dorothy L. C. Day, London ; A. M. Deane, St. Thomas's ; J. S. Dees, Middlesex ; A. De Souza, Cambridge and Middlesex ; G. P. Driver, St. Bart.'s ; W. H. Dunn, St. Thomas's ; Winifred P. Edmunds, King's Coll. ; Barbara J. Edwards, Birmingham ; J. Elgood and G. Elliot, St. Bart.'s ; V. H. Ellis, London ; A. C. M. Elman, Univ. Coll. ; T. J. Evans, Middlesex ; E. K. A. Firth, St. Thomas's ; T. F. Fox, Cambridge and London ; E. S. Frischmann, Manchester ; M. W. M. Gadrat, Paris ; P. Garson, St. Bart.'s ; W. H. George, London ; H. M. Golding, Bristol ; H. P. Goldsmith, Univ. Coll. ; W. Gough and F. E. Gould, Birmingham ; A. W. Grace, Univ. Coll. ; H. Graf, Liverpool ; F. H. K. Green, St. Bart.'s ; C. W. Greenway, Guy's ; R. J. Gregory, St. George's ; W. E. Grice, Middlesex ; A. B. Griffiths, Liverpool ; G. J. Griffiths, Middlesex ; R. D. Gross, Guy's ; S. A. Gunter, St. Bart.'s ; J. A. E. M. Hadley and L. W. Hale, Univ. Coll. ; C. S. Hallpike, Guy's ; J. G. Hamilton, London ; I. E. Harries, Guy's ; K. E. Harris, Cambridge and Univ. Coll. ; A. W. Hart Perry, St. Bart.'s ; R. C. Hatcher, Bristol ; Leila M. Hawksley, Royal Free ; L. I. Henzell, Univ. Coll. ; J. C. W. Hewetson, Guy's ; Gabrielle M. Highfield-Jones, Charing Cross ; E. W. Hicks, St. Thomas's ; H. A. Hirst, London ; J. A. Hislop, Durham ; S. A. Holford, Middlesex ; J. Holmes, Cambridge and St. Bart.'s ; A. Hooper, Leeds ; Gwynedd Hugh-Jones and Kathleen M. Hyslop, Royal Free ; Ethel J. Isaacs, Westminster ; S. P. Jacobson, Guy's ; H. Jaffe, Manchester ; T. G. I. James, Cardiff ; J. W. W. Jepps, Cambridge and St. George's ; A. T. Jones and W. Jones, Univ. Coll. ; P. C. Joscelyne, Bristol ; A. A. Khair, St. Bart.'s ; E. F. King, Bristol ; S. W. M. King, St. Bart.'s ; Charlotte A. Kingdon, St. Mary's ; F. Langford, Bristol ; A. L. Lankester, Cambridge and St. Thomas's ; N. E. Laurence and D. E. Lawrence, St. Bart.'s ; H. B. L. Levy, Durham ; Geraldine N. Longford, St. Mary's ; G. Lucas, London ; Kathleen M. Lyons, Univ. Coll. ; R. R. Macintosh and N. W. MacKeith, Guy's ; J. R. A. Madgwick, London ; Doris I. Mart, Univ. Coll. ; Lucy M. T. Masterman, St. Mary's ; M. Meyers, St. Bart.'s ; H. S. Morley, Univ. Coll. ; S. W. H. Moul, Charing Cross ; R. T. Mummery, Cambridge and St. Mary's ; C. A. Nadicarianda, London ; B. S. Nat, St. Andrews ; E. E. Neser, Guy's ; J. W. Newbold, Univ. Coll. ; I. Newton, Charing Cross ; C. P. O'Brien, St. Bart.'s ; F. W. Oldershaw, London ; R. D. Owen, Guy's ; R. Owen-Jones, Middlesex ; Lucy Parker, Royal Free ; G. W. V. Parry, T. G. W. Parry, and W. F. Payne, Guy's ; P. R. Peacock, Middlesex ; Betsy Porter, Royal Free ; Louisa M. Poynder, Charing Cross ; T. M. Preece, Cambridge and St. Bart.'s ; E. A. B. Pritchard, Cambridge and Univ. Coll. ; Evelyn R. Pyke, London ; S. A. H. Qureshi, St. George's ; A. J. Reed, London ; Laura M. Rhodes, St. Mary's ; R. L. Rhodes, Cambridge and St. Bart.'s ; O. F. W. Robinson, King's Coll. ; M. Rockfelt, Univ. Coll. ; M. Rose, Middlesex ; E. J. H. Roth, St. Bart.'s ; S. C. Rowbotham and M. Rubinstein, Guy's ; E. Rudge, Cambridge and St. Bart.'s ; R. W. Savage, St. Bart.'s ; Margaret B. Savory, Univ. Coll. ; R. W. Scarff, Middlesex ; F. L. Scott, King's Coll. ; E. C. Seward, Guy's ; C. J. L. Sharp, Cambridge and London ; H. Sheard, Leeds ; J. Silver, Middlesex ; F. A. H. Simmonds, Cambridge and St. Bart.'s ; A. S. Simpson and A. E. Slinger, King's Coll. ; G. F. Smith, Middlesex ; N. Smith, Cape and St. Bart.'s ; J. A. Smorfitt, Leeds ; Beatrice M. Smyth, Cambridge and London ; S. Snelson, Manchester ; W. R. Spurrell, Guy's ; R. H. Stanbridge, London ; R. S. Starkey, Cambridge and St. Thomas's ; E. G. Steeler, St. George's ; W. Stephenson, Durham ; J. D. M. Stewart, Cambridge and St. Bart.'s ; Viva E. K. Stuart, Royal Free and St. Mary's ; Edith C. Summerskill, Charing Cross ; H. H. D. Sutherland, St. Bart.'s ; T. R. Sutherland, Cambridge and St. Bart.'s ; Annie D. Symons, Royal Free ; A. K. Thomas, Univ. Coll. ; W. E. C. Thomas, Cardiff ; K. W. Thorp, Cambridge and St. Thomas's ; R. W. H. Tincker, St. Bart.'s ; H. S. Townsend, King's Coll. ; B. D. Underwood, London ; H. C. Van Dort, Ceylon and Middlesex ; D. C. Vaughan, Manchester ; H. F. Walker, Middlesex ; S. A. Walker, Liverpool ; Dorothy A. Waterfield, London ; E. R. Weaver-Adams, Cambridge and St. Thomas's ; Elizabeth N. Wells, Charing Cross ; H. J. W. J. Westlake, Guy's ; H. A. M. Whitby and H. B. White, St. Bart.'s ; Fanny M. Whittaker, Charing Cross ; G. W. Wigg, Durham ; Cicely F. Wilson, Bristol ; A. W. Wood, Birmingham ; Constance A. P. Wood, King's Coll. ; and S. C. H. Worseldine, Guy's.

UNIVERSITY OF BRISTOL.—At examinations held recently the following candidates were successful :—

FINAL EXAMINATION FOR DEGREES OF M.B., CH.B.

Part I. (including Forensic Medicine and Toxicology).—Arthur F. Alford, Kenneth F. Alford, David H. Beatson, Elizabeth E. Benson, Harry W. Brassington, Dorothy E. Crellin, Sidney J. H. Griffiths, Constance I. Ham, Frederick H. Hollingshead, John A. Hooker, Charles T. Hyatt, Arthur H. Lowther, Rosalie E. Lucas, Cecil P. Porter, David C. Prowse, Lennox G. Robertson, Herbert Rogers John F. Southward, Gertrude M. Terrell, Maria M. Tewater, Thomas W. Ware, and Kathleen M. Willmore.

Part I. only.—Gilbert M. Minifie.

Part II. (completing Examination.)—John A. James (first-class honours), Arthur P. Bodman and Herbert Taylor (second-class honours), Naomi J. Bown, Gilbert B. Bush, William L. Cossham, Frank R. Edbrooke, Norman J. England, Herbert M. Golding, Rowland C. Hatcher, Alexander G. Heron, Frederick G. Jenkins, Muriel V. Joscelyne, Patrick C. Joscelyne, Eric C. K. Kenderdine, Edgar F. King, Carrie H. Osmond, and Robert A. Sammons.

SECOND PROFESSIONAL EXAMINATION FOR DIPLOMA IN DENTAL SURGERY.

Sydney Phillips.

In Dental Mechanics and Dental Metallurgy only.—Christopher S. Cossham.

EXAMINATION FOR DIPLOMA IN PUBLIC HEALTH.

In Part I. only.—Eric G. Don.

FINAL EXAMINATION FOR DEGREE OF B.D.S.

Edgar K. Tratman.

FINAL PROFESSIONAL EXAMINATION FOR DIPLOMA IN DENTAL SURGERY.

Reginald G. Downes, George J. Kelly, and Brenda F. Taylor.

The degree of M.D. has been conferred on Mr. Macdonald Critchley for a dissertation on the Parathyroids and Calcium Metabolism.

HUNTERIAN SOCIETY.—The Hunterian oration on the Changing Standpoints in Cardiac Medicine will be delivered by Sir Sydney Russell-Wells on March 3rd at 9 P.M. at the Mansion House. A discussion will follow, to be opened by Dr. J. Strickland Goodall and Dr. B. H. Parsons-Smith.

RONTGEN SOCIETY.—A general meeting will be held on March 4th at 8.15 P.M. in the Institution of Electrical Engineers, Savoy-place, Victoria Embankment, London, W.C., when a paper on Hard and Soft Tubes in the Technique of Radiography, with a practical demonstration, will be read by Mr. N. E. Luboshez. The seventh Silvanus Thompson Memorial Lecture will be delivered by Prof. C. G. Barkla, F.R.S., at a general meeting of the society to be held at the Institution of Electrical Engineers on April 1st.

LONDON SCHOOL OF TROPICAL MEDICINE.—The Langley prize of about £30 will be awarded this year. This prize is open to competition among officers of the West African Medical Staff, whether on the active or retired list. The award will be made in respect of the best paper written on one of the following subjects : (*a*) Tropical Medicine or Surgery. (*b*) Tropical Hygiene and Sanitation. (*c*) Tropical Entomology and Parasitology. Papers should be delivered to the Secretary, Seamen's Hospital Society, Greenwich, London, S.E., on or before Oct. 1st, 1924.

RIVERS MEMORIAL FUND.—Friends and admirers of the late W. H. R. Rivers who have not yet subscribed, or by inadvertence have not been invited to subscribe, to this fund are asked to communicate with the treasurer, Dr. L. E. Shore, St. John's College, Cambridge. Subscribers are invited to attend a meeting which will be held at the rooms of the Royal Society, Burlington House, at 4 P.M. on March 25th, in order to decide on the form which the memorial should take.

Dr. Hugh Thursfield has succeeded Sir Dyce Duckworth as hon. consulting physician to the St. John's Foundation School, Leatherhead, for Sons of Poor Clergy.

THE Wellcome Museum of Tropical Medicine and Hygiene at 25-27, Endsleigh-gardens, London, N.W. 1, will be closed from March 1st until further notice, as it is proposed considerably to enlarge the museum.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The Charter Day dinner will be held in the College Hall, St. Stephen's Green, West Dublin, on Saturday, March 1st, at 7.30 P.M., when the principal guest will be H.E. the Governor-General.

THE LATE DR. E. J. DICKINSON.—Elmer John Dickinson, who died at Pietermaritzburg, Natal, on Feb. 4th, aged 37, was born in Canada, graduating M.D. at Winnipeg University in 1916. During the war he served with distinction as a captain in the Canadian Royal Army Medical Corps, gaining the Military Cross and the Croix de Guerre with palms. Although he had been but three years in Natal, his ability and genial personality had enabled him to build up a large practice in Pietermaritzburg.

OXFORD UNIVERSITY PRESS.—To celebrate its moving from Amen Corner into Warwick-square, the Oxford University Press is holding a luncheon on Tuesday, March 4th, at the new building. The Marquess Curzon, Chancellor of Oxford University, will preside, and the Archbishop of Canterbury and Mr. Asquith will propose the toast of the University. In his reply, Lord Curzon will propose the toast of the University of Cambridge, whose Chancellor, Lord Balfour, will reply.

METRIC SYSTEM IN U.S.A.—It is reported that a Metric Standards Bill, providing for gradual adoption in the United States of the metric units of weights and measures in commerce, has been brought before the House of Representatives and the Senate. According to the provisions of the Bill, the buying and selling of goods, wares, and merchandise will be in terms of the metric units after a period of ten years.

BRITISH SCIENCE GUILD.—A science news service has been inaugurated by the Guild with the object of providing in the lay press a weekly signed article dealing with some subject of special interest and a weekly column of science notes. It will also furnish reports of scientific progress. Scientific workers prepared to act as correspondents for the laboratories in which they are working are requested to communicate with Mr. Gordon D. Knox, 2, Guilford-street, London, W.C. 1.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The Royal Northern Hospital has arranged, in conjunction with the Central London Ophthalmic Hospital, the North-Eastern Fever Hospital, and the Royal Chest Hospital, to give a two weeks' intensive course, including all the general and special departments of medicine and surgery, from March 3rd to March 15th. Two afternoon sessions will be at the Central London Ophthalmic Hospital, one at the Royal Chest Hospital, and one morning session at the North-Eastern Fever Hospital. Apart from these demonstrations at other hospitals all the work will be undertaken by the members of the staff at the Royal Northern Hospital, and will include demonstrations of clinical methods and cases, lecture-demonstrations, and work in the wards and out-patient department from 10.30 to 5.30 each day. A special course in gynæcology will take place at the Chelsea Hospital for Women from March 3rd to March 28th. Clinical demonstrations and lectures will be given in the wards and out-patient department to be followed by lectures or operations in the theatre. Dr. Porter Phillips and Dr. Thomas Beaton will give a series of lecture-demonstrations in psychological medicine at Bethlem Royal Hospital from March 8th to April 5th. The demonstrations will be given on Thursdays and Saturdays at 11 A.M., and will deal with diagnosis and symptomatology of mental diseases, the psycho-neuroses, and the medico-legal aspects of insanity. Also a series of six lecture-demonstrations dealing with recent advances in medical electrical treatment will be given by Dr. C. B. Heald at the Royal Free Hospital on Wednesdays at 5.30 P.M. from March 5th to April 9th. A course on diseases of children has been arranged by the Royal Waterloo Hospital for Children and Women from March 17th to April 5th. The course will include lecture-demonstrations, ward work, out-patient cliniques each day from 2 o'clock onwards. Copies of the syllabus, with full particulars of the above courses and the fees payable for each course can be obtained on application to the secretary to the Fellowship of Medicine, at 1, Wimpole-street, London, W.

EDINBURGH: ROYAL MEDICAL SOCIETY.—The annual dinner of this Society was held on Feb. 21st in the Hall of the Royal College of Surgeons, Edinburgh. About 130 members were present and the guests included Prof. Gulland, Prof. Harold Stiles, Sir Robert Philip, Mr. J. Condie Sandeman, K.C. (Dean of the Faculty of Advocates), Sir Leslie Mackenzie, Prof. W. P. Patterson, D.D., Sir Byron Bramwell, and Sir J. Balfour Paul. Sir George Newman, as the guest of the evening, spoke of the future of medicine and its ever-extending rôle in the development of civilisation. He paid a generous tribute to the notable part played by the medical schools of Edinburgh, forming a great and imperial university, in furthering the art and science of medicine. Sir Harold Stiles, in replying to the toast of the Edinburgh Medical School, expressed the hope that more money would be available for preventive work along which lines the future of medicine must lie.

THE LATE DR. J. W. MULLEN.—The death of John William Mullen, L.R.C.S. & P. Irel., took place on Feb. 17th, at Ladywell Sanatorium, Pendleton, in his sixty-seventh year. A native of Dublin, Dr. Mullen was educated at Bective College, after obtaining his medical qualifications at the Royal Colleges of Surgeons and Physicians of Ireland. He went to Manchester, and at the age of 24 was appointed to the Wilton Fever Hospital, Salford, which was then of small dimensions. There he remained until the erection about 20 years ago of the Ladywell Sanatorium, an institution to which he devoted all his energies. Dr. Mullen held the position of medical superintendent of the Salford Corporation Hospitals for 43 years, and under his guidance and unselfish devotion to the Ladywell Sanatorium it became a model of its kind. Dr. Mullen is survived by a widow and daughter.

SUSSEX MATERNITY AND WOMEN'S HOSPITAL.—In future the Brighton and Hove Hospital for Women will be known by this name. The change of title was unanimously agreed upon at the annual meeting of the governors on Feb. 13th, when it was explained that the alteration was desirable owing to the confusion existing between the hospital and the institution in the town known as the New Women's Hospital. Owing to recent legislation the hospital had had to take in a large number of cases for the local authorities of a class which they did not previously deal with, and this had been one of the factors which had actuated the governors to take larger premises last year. The scheme for fitting up vacant rooms as wards for private patients paying full fees had been proceeded with, and the accommodation in this respect was nine beds, a private labour ward, a bathroom, and an office. Practitioners sending patients into these wards may attend them there should they so desire. Dr. R. D. Smedley, medical officer of health for West Sussex, in a short address on maternity work, warmly acknowledged the coöperation and the facilities for treatment granted by the hospital so readily eight years ago to the West Sussex County Council upon the inauguration of its maternity and child welfare work. With the increased accommodation the in-patients during 1923 numbered 614, as compared with 387 in 1922. Of these 234 were midwifery cases undertaken for the local authorities. The work on the district had been less by some 200 cases, which the governors attributed to the fall in the birth-rate. Out-patients increased from 648 to 676. Lady Burrell was elected President in succession to Lady Leconfield.

Appointments.

HUNT, E. R., M.D., B.C. Cantab., M.R.C.P. Lond., has been appointed Honorary Consulting Physician to the Haywards Heath Hospital.

JENNINGS, H. C., M.B., B.S., D.P.H., Temporary Medical Officer of Health to the Holland County Council.

Certifying Surgeons under the Factory and Workshop Acts: BUCHANAN, R. F. C. H., L.R.C.P., L.R.C.S. Edin., L.R.F.P.S. Glasg. (Coniston); LINDSAY, A., M.B., Ch.B. Glasg. (Nantgaredig); HENDERSON, J. M., M.B., Ch.B. Edin. (Greenlaw).

Vacancies.

For further information refer to the advertisement columns.

Bath Ear, Nose and Throat Hospital, Marlborough Buildings.—Hon. Pathologist.

Birmingham, Highbury, Uffculme and Sorrento Hospitals.—Med. Supt. £800.

Bradford Children's Hospital.—H.S. £125.

rdiff, King Edward VII Welsh National.—Asst. R.M.O.'s. £375 and £250 respectively.
ntral London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. £75.
aring Cross Hospital, W.C.—Asst. Obstet. P.
ncaster Royal Infirmary.—Sen. H.S. £200.
eter, Royal Devon and Exeter Hospital.—H.P. £150.
derated Malay States, Central Mental Hospital.—Asst. Med. Supt. £616.
rdon Hospital for Rectal Diseases, Vauxhall Bridge-road, S.W.—Anæsthetist.
lifax Royal Infirmary.—Hon. Ophth. S. and Hon. Radiologist.
rtford County Hospital.—Hon. Asst. S.
o Rural District.—Part time M.O.H. £60.
eds City.—Asst. M.O.H. £750.
icester City Education Committee.—Asst. Sch. M.O. £600.
ndon Homœopathic Hospital, Great Ormond-street, W.C.—Third Anæsthetist. £50.
anchester, Royal Children's Hospital, Pendlebury.—Res. Surg. O. £80.
anchester Victoria Memorial Jewish Hospital.—Res. M.O. £250.
etropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—H.S. £150. Also Clin. Assts.
ational Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. £150.
ational Hospital for the Paralysed and Epileptic, Queen-square, W.C.—Asst. P.
ewcastle-upon-Tyne Hospital for Sick Children—Jun. R.M.O. £120.
ewcastle-upon-Tyne, University of Durham College of Medicine.—Lectureship on Med. Jurisprudence.
ueen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—Two Asst. Res. M.O.'s. Each £80. Also Sen. R.M.O. £100.
ueen's Hospital for Children, Hackney-road, Bethnal Green, E.—H.P. and H.S. Each £100.
ichmond, Royal Hospital, Surrey.—Asst. H.S. £100.
oyal Ear Hospital, Dean-street, Soho, W.—Hon. Anæsthetist.
oyal Free Hospital, Gray's Inn-road, W.C. H.S.
oyal Northern Hospital, Holloway, N.—M.O. to Out-Patients. £150.
oyal National Orthopædic Hospital, 234, Gt. Portland-street, W.—H.S. £150.
. Mark's Hospital for Cancer, &c., City-road, E.C.—H.S. £200.
. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. £75.
. Thomas's Hospital.—Ophth. S.
alford Royal Hospital.—Res. M.O. £175. Three H.S.'s and Cas. H.S. Each £125.
effield Royal Infirmary.—Asst. Cas. O. £60.
outhampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.
underland Royal Infirmary and Children's Hospital.—Vistg. M.O. for X Ray, &c., Dept. £400.
niversity College Hospital Medical School.—Graham Scholarship in Pathology.
est London Hospital, Hammersmith-road, W.—One H.P. and Two H.S.'s. Each £100.

Births, Marriages, and Deaths.

BIRTHS.

IGGER.—On Feb. 24th, at Brackenhurst, Walton-on-Thames, the wife of W. G. Bigger, M.B., B.Ch., of a son.
RAIMBRIDGE.—On Feb. 10th, at Wigmore-street, W., the wife of Dr. C. V. Braimbridge, Kenya Medical Service, of a son.
ARLISLE.—On Feb. 17th, at "Ardlair," Heswall, Cheshire, the wife of H. G. Carlisle, M.D., of a daughter.
RAMER.—On Feb. 14th, at The Pryors, Hampstead, the wife of Dr. William Cramer, of a son.
OWLER.—On Feb. 22nd, at Pinewood, Wokingham, Berks, the wife of William C. Fowler, M.D., B.S. Lond., of a son.
REENWOOD.—On Feb. 23rd, 1924, at 55, Crouch Hall-road, Crouch End, N. 8, the wife of A. Atkins Greenwood, M.B., B.S., M.R.C.S., L.R.C.P., of a daughter.
EBERT.—On Feb. 24th, at Wigmore-street, the wife of G. T. Hebert, M.D., of a daughter.

MARRIAGES.

OBB—WALLACE.—On Feb. 21st, in London, Captain Campbell Robb, R.A.M.C. (retired), to Marjorie Macneil Wallace, elder daughter of the late Alexander Scott, M.D., of Glasgow.

DEATHS.

STIN.—On Feb. 19th, at Gwylfa, Maerdy, Corwen, suddenly, Wilson Astin, M.B., C.M., aged 60 years.
ATE.—On Feb. 20th, of pneumonia, at Millbank Hospital, Colonel A. L. F. Bate, C.M.G., A.M.S.
OND.—On Feb. 20th, at Torquay, of pneumonia, William Arthur Bond, M.D., F.R.C.P. (late M.O.H., Holborn), aged 67 years.
ANSDOWN.—On Feb. 17th, at Oakfield-road, Clifton, Bristol, Robert Guthrie Poole Lansdown, M.D., B.S., M.R.C.S., L.R.C.P., aged 60 years.
ACNAIR.—On Feb. 16th, in a nursing home, London, Alfred Duncan Macnair, M.D. Glasg., The Grange Drive, Winchmore Hill, N.
OSS.—On Feb. 19th, at Porchester-road, Bournemouth, Daniel McClure Ross, M.D., F.R.C.S., in his 75th year.
PURGIN.—On Feb. 15th, at Dallington, Northampton, Herbert Branwhite Spurgin, M.R.C.S. Eng., L.S.A. Lond., aged 81 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary.

SOCIETIES.

THE ROYAL SOCIETY.

THURSDAY, March 6th, at 4.30 P.M.—*Papers to be read:* E. D. Adrian, F.R.S. and Sybil Cooper: The Electric Response in Reflex Contractions of Spinal and Decerebrate Preparations. A. Fleming: A Comparison of the Activities of Antiseptics on Bacteria and on Leucocytes. (Communicated by Sir Almroth Wright, F.R.S.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, March 3rd.

TROPICAL DISEASES AND PARASITOLOGY: at 8.30 P.M.
Paper:
Lieut.-Colonel R. McCarrison, I.M.S. (Pasteur Institute of Southern India): Rice in Relation to Beri-beri in India.
N.B.—Members of the Sections of Medicine, Pathology, and Therapeutics and Pharmacology are specially invited to attend this meeting.

Tuesday, March 4th.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)
Cases:
Mr. Laming Evans: Cases of Congenital Hemiplegia in Similar Twins.
Mr. Bernard Roth: (1) Bony Ankylosis of Elbow, (2) Fractured Clavicle treated by Sayre's Method with Resulting Paresis.
Mr. S. L. Higgs: Specimen of Congenital Absence of Sacrum.
Cases will also be shown by Mr. McCrae Aitken, Mr. R. C. Elmslie, and Mr. Gordon Pugh.

PATHOLOGY: at 8.30 P.M. At the Lister Institute, Chelsea-gardens, S.W.
Communications:
Dr. S. P. Bedson and Dr. M. E. Johnston: Further Observations on the Genesis of Platelets.
Mr. H. Schütze: Results of treating Tuberculous Guinea-pigs with Diaplyte Vaccine.
Dr. J. A. Arkwright and Mr. A. N. Goyle: The Relation of "Rough" and "Smooth" Variants to the "O" and "H" Forms of Weil and Felix.
Mr. M. L. Cowan: Experimental Production of Immunity to Streptococci in Rabbits.
Dr. E. E. Atkin: A Comparison of Meningococcal and Gonococcal Colonies on a Special Medium.

Wednesday, March 5th.

MEDICINE, SURGERY, THERAPEUTICS AND PHARMACOLOGY: at 5.30 P.M. (to be adjourned to 8.30 P.M. if necessary).
Joint Discussion on
The Treatment of Severe Gastric and Duodenal Hæmorrhage, Mr. Cyril A. R. Nitch (President of the Section of Surgery) in the chair.
Speakers:
Surgical: Mr. H. J. Paterson (opener), Mr. A. H. Burgess, Mr. R. P. Rowlands, Mr. G. Gordon-Taylor.
Medical: Sir William Willcox, Dr. A. Hurst, Dr. Izod Bennett.
Therapeutical: Dr. P. Hamill.

Thursday, March 6th.

BALNEOLOGY AND CLIMATOLOGY: at 5.30 P.M.
Paper:
Dr. J. Burt: On the Causes of Brachialgia.

STUDY OF DISEASE IN CHILDREN, NEUROLOGY, OBSTETRICS AND GYNÆCOLOGY, ORTHOPÆDICS: at 8 P.M.
Joint Discussion on
Birth Injuries, with Special Reference to Intracranial Injuries with Hæmorrhage, and to Nerve Injuries.
Opener: Mr. Eardley Holland (Obstetrics and Gynæcology).
Other Speakers: Dr. Collier (Neurology), Mr. Fairbank (Orthopædics), Dr. Cameron (Study of Disease in Children).

Friday, March 7th.

LARYNGOLOGY: at 5 P.M. (Cases at 4 P.M.)
Discussion on
Suppurative Diseases of the Frontal, Ethmoidal, and Sphenoidal Sinuses.
Illustrative cases will be shown.
The following have promised to take part in the Discussion: Mr. Herbert Tilley, Sir StClair Thomson, Sir William Milligan, Mr. E. Watson-Williams, Mr. Logan Turner, Dr. P. Watson-Williams, Dr. W. T. Gardiner.

ANÆSTHETICS: at 8.30 P.M.
Paper:
Prof. Storm van Leeuwen (Professor of Pharmacology, University of Leyden): The Anæsthetic Properties of the Purest Ether: Ether of Crystallisation.
N.B.—Members of the Section of Therapeutics and Pharmacology are specially invited to attend this Meeting.

Saturday, March 8th.

OTOLOGY: at 10 A.M. (Cases at 9.15 A.M.)
Cases and Specimens:
Mr. Richard Lake: (1) Case of Vertigo, probably Central in Origin; (2) (with Dr. E. A. Peters) a Thick Flap for the Partial Lining and Diminution of Too Large

Mastoid Cavities; (3) Forceps for Use in Tonsillar Dissection.
Dr. Collier (introduced by Mr. Richard Lake): (1) Abscess of Lateral Sinus; (2) Cerebral Abscess.
Cases will also be shown by Sir James Dundas-Grant, Dr. Dan McKenzie, Mr. T. B. Jobson, and others.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
WEDNESDAY, March 5th.—9 P.M., Dr. R. A. Young: The Treatment of Pulmonary Tuberculosis. (Second Lettsomian Lecture.)

HUNTERIAN SOCIETY.
MONDAY, March 3rd.—9 P.M. (at The London Mansion House). Sir Sydney Russell-Wells: Changing Standpoints in Cardiac Medicine. (Hunterian Oration.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, March 3rd, to Saturday, March 8th.—BETHLEM ROYAL HOSPITAL. Course in Psychological Medicine: Sat., 11 A.M., Dr. Porter Phillips: Diagnosis and Symptomatology of Mental Diseases.—CHELSEA HOSPITAL FOR WOMEN. Daily: Operations, &c. Mon., 2 P.M., Mr. Giles: Tues., 5 P.M., Mr. Bonney: Mechanism of Genital Displacement; Wed., 2 P.M., Mr. Galletly: Case-taking. Demonstration in Wards: 4 P.M., Mr. Ellison: Pelvic Pain; Thurs., 2 P.M., Mr. Giles: Obstetrics and Gynæcology in Relation to the State; Fri., 2 P.M., Mr. Banister: Disorders of Micturition.—ROYAL FREE HOSPITAL. Wed., 5.30 P.M., Dr. Heald: The Diathermy Current—Its Uses and Applications.—ROYAL NORTHERN HOSPITAL, in conjunction with the CENTRAL LONDON OPHTHALMIC HOSPITAL, NORTH-EASTERN FEVER HOSPITAL, and ROYAL CHEST HOSPITAL. Special Intensive Course (first week), as per Syllabus.
Further particulars can be obtained from the office at 1, Wimpole-street, W. 1.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, March 3rd.—10 A.M., Surgical Registrar: Surgical Pathology. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Mr. Simson: Diseases of Women.
TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards. 2.30 P.M., Dr. Pritchard: Medical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—10.30 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Banks-Davis: Diseases of Throat, Nose and Ear.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE (Prince of Wales's General Hospital).
(At 4.30 P.M.)
(Open to Members of the College only.)
MONDAY, March 3rd.—Mr. Aubrey Goodwin: Retroversion.
TUESDAY.—Mr. C. H. Hayton: Septic Sinus Thrombosis of Otitic Origin.
THURSDAY.—Mr. J. Bright Banister: Prolapse.
FRIDAY.—Dr. L. R. Yealland: Clinical Demonstration of Cases.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, March 4th.—5 P.M., Dr. Whitfield: Lichen Planus.
THURSDAY.—5 P.M., Dr Fox (Chesterfield Lecture): Cutaneous Syphilis.

ST. THOMAS'S HOSPITAL, Albert Embankment, S.W.
(In the Governors' Hall.)
THURSDAY, March 6th.—5 P.M., Dr. J. A. Murray: Cancer. (Third Lecture.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
THURSDAY, March 6th.—4 P.M., Dr. A. M. H. Gray: Ringworm.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, March 5th.—4.30 P.M., Dr. Stanley Wyard: Cancer of the Stomach.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, March 6th.—5 P.M., Mr. W. Gilliatt: Eclampsia and its Treatment.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, W.
TUESDAY, March 4th.—5.15 P.M., Mr. Joseph Barcroft, F.R.S.: The Respiratory Pigments in Animal Life and Their Significance. (Lecture IV.)
FRIDAY.—9 P.M., Dr. Walter Rosenhain, F.R.S.: The Inner Structure of Alloys.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, March 5th.—4 P.M., Dr. B. T. J. Glover: Difficulties in the Campaign against Tuberculosis.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEBRUARY–MARCH, 1924.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, March 3rd.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Clinical Types of Paraplegia: Dr. Aldren Turner.
TUESDAY, March 4th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Subacute Combined Degeneration: Dr. Adie.
THURSDAY, March 6th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Electrical Reaction of Muscles: Dr. Bailey.
FRIDAY, March 7th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Neurosyphilis: Dr. James Collier.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, March 3rd.—12 noon, Subacute Combined Degeneration and Other Forms of Combined Sclerosis: Dr. J. G. Greenfield.
The fee for the Course, including Pathology, is £5 5s. For those who hold Perpetual Tickets the fee is £3 3s.

COURSE OF LECTURES ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.
WEDNESDAY, March 5th.—12 noon, Afferent Systems to Thalamus and Cortex.
THURSDAY, March 6th.—12 noon, Cerebral Cortex: Function; Projection Systems: Dr. Kinnier Wilson.
The fee for this Course will be £2 2s.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, March 5th.—3.30 P.M., Ocular Palsies and Disturbances of Ocular Movement: Mr. Leslie Paton.
The fee for this Course alone is £5 5s. If taken in conjunction with the general Post-Graduate Course the fee is £3 3s. All applications should be sent to the Secretary, Medical School.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

VICTORIA UNIVERSITY OF MANCHESTER MEDICAL SCHOOL.
THURSDAY, March 6th.—5.30 P.M., Prof. Fawcett: The Development, Normal and Abnormal, of the Bones around the Mouth.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, March 4th.—4.15 P.M., Dr. W. E. Fothergill: Puerperal Pelvic Infection.

ST. MARY'S HOSPITALS, MANCHESTER, POST-GRADUATE LECTURE (at Whitworth-street West Branch).
FRIDAY, March 7th.—4.30 P.M., Dr. J. W. Bride: Hæmorrhage in Association with Pregnancy, Labour, and the Puerperium.

ANCOATS HOSPITAL LECTURES.
THURSDAY, March 6th.—4.30 P.M., Dr. Norman Kletz: Rheumatoid Arthritis and Allied Conditions.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, March 3rd.—(At the Children's Hospital.) Mr. McMurray: Congenital Deformities.
TUESDAY.—(At the Southern Hospital.) Dr. J. H. Mather: X Rays in the Diagnosis of Phthisis.
WEDNESDAY.—(At the Northern Hospital) Dr. Cunningham: Acidosis.
THURSDAY.—(At the Stanley Hospital.) Mr. F. Strong-Heaney: Infections of the Bladder and Kidneys.
FRIDAY.—(At the Royal Infirmary.) Dr. Wallace Jones: Some Points in the Prognosis and Treatment of Kidney Disease.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES. (At 3.30 P.M.)
TUESDAY, March 4th.—(At the Royal Infirmary.) Mr. Finch: Diagnosis and Treatment of Injury to the Semilunar Cartilages.
FRIDAY.—(At the Royal Hospital.) Prof. Hall: The Clinical Significance of Headache.

DECREASE OF DRUNKENNESS IN RUGBY.—At the annual licensing sessions held recently in Rugby Dr. Clement Dukes, the chairman, commented on the encouraging decrease in arrests for drunkenness in the town for the past decade. The improvement had been steady and remarkable; in 1911, the figures showed a rate of 37 per 10,000 of the population, while in 1921 the proportion had sunk to 4·60 per 10,000. Viewing these facts in their widest interpretation, Dr. Dukes said it was evident that we, as a nation, are sobering ourselves, and have learnt the sensible course of taking a glass too little instead of a glass too much. Prohibition, he continued, was no remedy for drunkenness, State control might, as he had shown, do a great deal, but the highest and best remedy was self-control.

Notes, Comments, and Abstracts.

THE ADMINISTRATION OF BENEFITS UNDER THE NATIONAL HEALTH INSURANCE SYSTEM OF ENGLAND.[1]

BY H. S. BEADLES, M.R.C.S. ENG.,
CHAIRMAN OF THE WEST HAM INSURANCE COMMITTEE; SECRETARY OF THE WEST HAM LOCAL MEDICAL AND PANEL COMMITTEES.

THE primary and most excellent postulate of the National Insurance Act of 1911—the enjoyment of nine pennyworth of benefits for the contribution of 4*d.* per week—has not been realised. Indeed, such realisation was doomed at the birth of the scheme through the dissection of the limbs from the trunk by the instrument creating it. The scheme purports to be national; but there are few, if any, approved societies which represent all classes and types of the insured community. The authors of the Act of 1911, in choosing the friendly and industrial societies as the media for carrying out the administration of cash benefits, ignored the diversity of causes from which the existence of such societies had sprung. Those existing in 1911 owed their origin to a variety of motives. Some were the result of the unity of persons of particular schools of thought, particular trades or callings, of peculiar health standards, and otherwise. Even members of those which purport to embrace individuals irrespective of class or creed must, in their societies' development, become reduced to a common level of health standard differing from that of other societies. Yet all societies are credited with income upon the assumption of a general national average risk, notwithstanding that a preponderance of healthy lives has become grouped together in some societies while a preponderance of unhealthy lives exists in others.

Different Benefits in Different Societies.

Differentiation in the benefits accruing to the insured persons thus becomes inevitable. The member of one society finds himself entitled to extra sick pay, extra disablement benefit, higher maternity benefit, dental treatment, and what not. His brother, having joined a society of less healthy people, finds himself entitled to the minimum benefits under the original Act, to maintain which he is called upon to pay higher contributions under a penalty for non-compliance, of having the required amount deducted a number of times over from any of the said minimum cash benefits to which he may, at some future date, become a claimant.

Examine the provisions for the extra benefits and the penalties for deficiencies to which reference is made, and see how these things have actually worked out on first valuation. Section 37 of the National Insurance Act of 1911 confers powers upon societies showing surpluses on valuation to submit for the approval of the Minister of Health schemes for the distribution of such surpluses by way of conferring upon their members any one or more of the additional benefits set out in Part III. of the Fourth Schedule to the Act. These are: Medical treatment of dependents, dental treatment, increased sick pay or disablement pay, or the payment of such benefits in certain contingencies, increased maternity benefit, convalescent homes, pensions and superannuation allowances, payments to persons in want or distress, &c. It will be seen that these benefits might well be classified as either "benefits in cash" or "benefits in kind." With regard to the deficiencies provisions, Section 38 of the National Insurance Act, 1911, requires societies with expenditures in excess of incomes disclosed by valuation to submit schemes to the Minister of Health for making good the losses, either by compulsory levy or increase of the weekly rate of contribution, by reduction of sick pay, for either the whole, or part, of any period during which such benefit is payable, by otherwise altering the conditions attaching to the payment of cash benefits, or by any other method approved by the Minister.

Valuation Results.

In the Ministry of Health's 1919–20 annual report on national health insurance, particulars are given of the issue to approved societies in England of their valuation reports, and of the initial work in connexion with the adoption of schemes of additional benefits. It appears that the schemes of additional benefits adopted in England do not cover about 1,000,000 insured persons of England. Moreover, the Minister of Health points out in his report that with lapse in membership, and the influx of new members, there is a constant tendency to reduction in the number of members who are entitled to additional benefits during the currency of a scheme.

The degree of confusion into which the so-called national health insurance has sunk will be readily appreciated upon realisation of the extraordinary number of departures from the original benefits offered by the Act of 1911, and the consequent variations in the types of benefits enjoyed by one insured person, compared with another, as disclosed by the official statements of additional benefits. This is the result of the first valuation. If the system is allowed to continue, subsequent valuations can only result in intensification of the confusion.

Can one conceive a more illogical and pernicious system than this? One million persons have been compelled to join groups of their fellows in order to endeavour to insure themselves against contingencies. Having done so, they find themselves made parties to the gamble—"premiums based upon general average risks of the insured community; opposed to contingencies only covered to the limited extent allowed by the average health experiences within the confines of the societies in which they find themselves."

It means, in effect, that if they are members of societies having unhealthy membership, some of their fourpences per week are providing ninepences and more for the members of the societies having healthy membership. In addition, they may be called upon to contribute some additional pennies or so per week in order to become entitled to even the minimum benefits contemplated by the Act.

The extraordinary thing about the situation of these unfortunate victims of the system is that, should they desire and take steps to put themselves on a par with their more fortunate brothers by transferring their membership of society, they find themselves "up against" most formidable forces of obstruction; and even should they by chance overcome these, they only enter new societies upon the condition that they do not participate in any extra benefits that may be enjoyed by the members of longer standing.

Administration of Additional Benefits Unsatisfactory.

The administration of extra benefits, more particularly of those in kind, such as dental and the so-called optical treatment, and nursing benefit, is unsatisfactory. Notwithstanding the provisions of Section 14 (1) of the original Act that additional benefits in the nature of medical benefits should be administered territorially, the approved societies, with utter disregard to the convenience and best interests of their members, laid claim to, and secured, the right to manage dental, optical, and nursing schemes. A completely new business organisation was set up under some such title as "Beneficent Society" purporting to conduct negotiations on terms with representative organisations of opticians and dentists, and otherwise to act on behalf of societies including these services in their schemes. Scales of charges have been prepared and issued to all the societies interested throughout the country. So far as my district is concerned, there appears to have been little, if any, effort made to acquaint the insured persons generally of their rights in relation to either dental or optical treatment or nursing. In cases where the insured person has, by rumour or hearsay, become aware of the means whereby he can obtain these benefits, and has applied for one or other of them with some means of success, his hopes have subsequently been shattered by the unwillingness of his society to pay the whole cost of his requirements as estimated by the dentist or optician, as the case may be. The optical treatment previously mentioned has proved in actual practice to have resolved itself into the supply of glasses by opticians and not to treatment by ophthalmic surgeons. The dangers of this practice cannot be exaggerated, and it is certainly not giving to insured persons treatment equivalent to that available to the ordinary uninsured individual.

There are signs that advantage is being taken of the opportunities afforded by this system of administration to create incentives whereby business is caused to flow to certain establishments to the exclusion of others.

I do not here propose to go very deeply into the subject of deposit contributors. Suffice it to say that the disabilities suffered by the members of a weak society are intensified in the case of these contributors, and under no stretch of imagination can it be said that the contributions extracted from them represent insurance premiums. The better definition might well be the compulsory temporary segregation of wages and trade funds for no good purpose, and without interest-earning power. Yet this class is bound to exist under the approved society system of administration. If a deposit contributor suffers from an unhealthy record, approved societies do not want him, and will not have him. If he enjoys a healthy record, he probably remains a deposit contributor because he wants nothing to do with approved societies.

Section 63.

No Act of Parliament of modern times has conferred a greater power of improving the health conditions of the community at large than that given to approved societies under Section 63 of the National Health Insurance Act, 1911.

[1] An abstract of papers which appeared in the National Insurance Gazette of Dec. 15th and 22nd, 1923.

relating to excessive sickness caused by inadequate public health precautions, insufficient or insanitary housing, &c. Yet in actual practice the approved societies, through the very nature of their constitution and wide membership, are rendered incapable of performing the necessary inquiries, and undertaking successfully the required steps to secure observance of the Public Health or Housing of the Working Classes Laws. Much less can a society consisting of members employed in abnormally unhealthy trades address itself to the problem.

The distribution of cash benefits should be closely linked with the task of restoring the sick to good health, the provision of preventive treatment, and the maintenance of the good health of the community. Every certificate issued by the insurance practitioner represents a cheque drawn upon the insurance bank and the public purse. Approved societies are certainly not the instruments through which such link can be satisfactorily established and maintained.

THE QUEEN'S DOLL'S HOUSE.

To the Editor of THE LANCET.

SIR,—One always hesitates to criticise a chef-d'œuvre, but a work which aims at being an exposition of the perfect house of to-day should be, like Cæsar's wife, above suspicion. The penalty of being an expert is to have to find fault where one would wish to concur, and in regard to one aspect of the domestic hygiene of the Queen's Doll's House the sanitary expert finds himself in this dilemma.

No plan of the Doll's House has been published, but from the illustrations of the actual rooms it can be perceived that the relation of certain apartments could not but seriously qualify the sanitary certificate of an independent professional adviser. That the arrangement in question is expressly against the by-laws has, of course, no force in this instance of a royal palace, and for the expert the question is governed solely by the laws of sanitary science. In modern house-planning de luxe, especially in continental practice, it is becoming very common to discount some of the fundamental principles of sound sanitation, but the fact remains that what may be immediate advantages are only secured at the risk of ultimate danger to health.

It will be seen that the criticism of this letter is actually directed against a modern tendency to relax the vigilance inspired by the work of sanitary pioneers. But the great historical significance of the wonderful achievement of the Queen's Doll's House is, I trust, sufficient justification for my calling in question this one intimate detail of it.

I am, Sir, yours faithfully,

London, Feb. 23rd, 1924. SANITARY EXPERT.

COMPARATIVE MORTALITY IN THE METROPOLITAN BOROUGHS.

IN reply to a question addressed to him in the House of Commons a few days ago the Minister of Health gave comparative figures of mortality in the several Metropolitan boroughs as shown below:—

"ACOUSTIQUE" ELECTRICAL AIDS FOR THE DEAF.

THE Acoustique Company, of 95, Wigmore-street, London, W., have submitted to us a selection from their newest styles of apparatus. They state that they have introduced a new type of transmitter which is now to be employed in all their instruments; it is very light and flat, so that a single transmitter can be worn quite conveniently under the lapel of the coat. The more powerful instruments have three or four transmitters and, in some models, these can be placed in a box for use as a table-instrument or taken out and worn on the person. In one ingenious model the microphones are accessible, so that a broken carbon can be removed and replaced; this should be a great convenience to those living in distant countries, and one may hope that this improvement will eventually be possible on all the apparatus. The table instruments are particularly small, light and powerful, and are fitted with a resistance to moderate the strength of current. In all the tone is round and pleasing, and there is a remarkable absence of "buzz" or extraneous sound; this can be still further eliminated by the use of the "non-head attachment," which consists of an indiarubber tube to be screwed into the receiver and attached to a nipple to fit into the meatus, and which has now been improved by the addition of a hook-shaped metal tube to fit comfortably over the pinna. The prices range from 3½ to 25 guineas.

BLOOD-SUPPLY OF THE BRAIN IN THE OX.

To the Editor of THE LANCET.

SIR,—My attention has been drawn to an article by Dr. Leonard Hill in your issue of Dec. 22nd, 1923, on the Humanity of Methods of Slaughter. I quite agree with the conclusions to which he comes and the suitability of the method of slaughter which he supports, but I disagree with one of his statements of fact. In the section referring to throat-cutting he states that it must be borne in mind that the vertebral arteries do not also supply the brain of cattle, but end in the muscles of the head. This is not so. The vertebral arteries certainly supply the brain of the ox. I have recently dissected these arteries and find that the description and figure in Sisson's "Anatomy of the Domestic Animals" are correct. This book states that a continuation of the vertebral artery passes forwards to the floor of the cranium and concurs with the condyloid and branches of the internal maxillary artery in the formation of a large rete mirabile. The latter takes the place of the internal carotids. It is thus clear that the arteries under discussion carry blood to the brain in the ox as in the horse. But I should expect that the cutting of the two common carotids would bring about such an immediate fall of blood pressure in the common brachio-cephalic trunk that the amount of blood passing to the brain by the vertebrals would be negligible. This is proved by the manometer experiment upon the calf. I am, Sir, yours faithfully,

BERNARD GORTON.

Royal Veterinary College, Camden Town,
Feb. 23rd, 1924.

Comparative Figures of Mortality in Metropolitan Boroughs.

Metropolitan borough.	1918.		1919.		1920.		1921.		1922.		1923.*	
	D.-R.	I.-M.	D.-R.	I.-M.	D.-R.	I.-M.	D.-R.	I.-M.	D.-R.	I.-M.	D.-R.	I.-M.
City of London	18·8	158	14·3	115	14·7	71	12·0	109	14·1	61	11·5	81
Inner and Middle Temples							10·2	—	13·9	—	3·5	—
Battersea	18·7	99	12·9	74	12·4	83	12·2	74	13·2	69	10·7	48
Bermondsey	22·2	134	13·7	92	14·3	85	13·8	93	16·9	100	12·1	73
Bethnal Green	23·9	129	13·9	85	14·6	95	12·9	100	15·3	91	11·3	69
Camberwell	18·3	102	12·6	82	12·5	71	12·1	74	13·5	78	11·0	56
Chelsea	19·5	88	15·0	83	12·0	53	13·6	82	13·5	65	12·1	55
Deptford	18·0	98	13·0	86	12·6	79	12·2	88	13·8	74	10·9	58
Finsbury	23·9	109	15·3	88	15·3	77	14·8	91	16·3	82	13·1	60
Fulham	17·5	109	12·2	82	11·5	74	11·8	84	12·1	69	10·5	63
Greenwich	19·5	118	13·6	94	12·3	72	12·2	75	12·9	57	10·8	62
Hackney	18·9	112	13·1	83	13·0	81	11·5	66	12·8	73	10·6	58
Hammersmith	17·3	102	12·7	99	12·3	67	12·7	88	12·9	71	10·8	63
Hampstead	14·3	77	11·8	83	9·9	48	11·2	66	11·2	56	10·3	42
Holborn	22·7	147	16·4	96	13·9	67	12·8	79	13·3	72	12·1	76
Islington	20·5	110	14·3	86	13·7	72	13·2	82	13·9	76	11·6	66
Kensington	17·8	91	15·3	102	12·5	83	13·8	107	13·6	84	12·0	71
Lambeth	19·3	97	14·8	86	12·8	69	12·2	76	13·8	77	11·4	58
Lewisham	14·8	72	11·6	62	11·0	67	10·5	56	11·2	55	10·3	45
Paddington	19·2	116	13·3	91	11·8	78	12·1	91	13·0	70	11·5	68
Poplar	22·7	110	14·5	84	14·6	82	12·8	83	14·3	79	11·2	59
St. Marylebone	18·7	113	15·7	94	12·5	67	12·9	73	13·8	68	11·5	68
St. Pancras	22·3	102	13·4	87	13·5	74	13·0	76	14·6	74	12·0	63
Shoreditch	24·2	163	15·7	106	15·3	91	14·2	111	16·3	103	12·9	80
Southwark	23·5	126	14·9	93	14·9	87	14·3	90	15·6	79	12·8	68
Stepney	20·9	113	14·5	81	14·1	87	13·1	90	14·1	80	11·6	63
Stoke Newington	18·1	93	12·9	65	13·1	80	12·1	54	13·6	67	10·6	18
Wandsworth	15·2	95	11·3	72	10·9	64	10·7	67	11·3	62	10·1	52
Westminster	16·5	108	14·4	91	11·3	73	11·7	81	12·9	65	10·5	46
Woolwich	15·6	106	12·3	86	10·9	61	11·6	62	11·6	62	9·1	7

D.-R. = Total death-rate per 1000 living of all ages. I.-M. = Death-rate under one year per 1000 births. * Provisional.

An Address
ON
DISEASE OF THE STOMACH AND ITS SURGICAL TREATMENT.

Delivered at the Surgical Section of the Royal Academy of Medicine in Ireland, on Feb. 29th, 1924,

BY JAMES SHERREN, C.B.E., F.R.C.S. ENG.,
SURGEON TO THE LONDON HOSPITAL, ETC.

I HAVE purposely left the title of my address vague, s I wish to touch upon several topics and draw ttention to unsolved points in connexion with disease f the stomach.

The surgery of chronic ulcer of the stomach—I nclude in this term what is embryologically stomach, he duodenum to the entrance of the common bile-uct—is in a transitional state, and we have to resort ill to operative measures, which are either mutilating, hysiologically unsound, or both. It must remain n this condition until we have obtained exact know-dge of the cause of the disease; we can then treat ie patient before these procedures become necessary. Ve must, I think, look on it somewhat as a reproach, iat lesions, which should be capable of curative eatment by simple means, are allowed to progress ntil direct interference with the stomach is required restore the patient to health. I do not consider ie results of the operations we are carrying out nsatisfactory; far from it, they are excellent, in me cases little short of miraculous. In chronic lcer, they far exceed those obtained by any form of iedical treatment, whether looked upon from the oint of view of cure or of the risk attaching thereto.

PREVENTABLE ABDOMINAL EMERGENCIES.

As long ago as 1911,[1] in a paper dealing with the revention of abdominal emergencies, I expressed the pinion that perforation of a gastric or duodenal ulcer curs in patients in whom, "in the majority of cases, mptoms have existed for weeks, months, or years, hich should have led to the recognition of organic sease and surgical treatment before urgency arose." went on as follows: "It has fallen to my lot several mes to operate on cases of duodenal and gastric ulcer hich had perforated while they were having ambu-tory medical treatment for dyspepsia variously amed." My experience since has abundantly con-med this; and further, I have had to operate on veral patients whose chronic ulcers had perforated, caused hæmorrhage while they were undergoing a urse of medical treatment in bed.

The preventable nature of many of these emer-ncies is corroborated by the London Hospital gures. Thus, among 218 cases of perforated iodenal ulcer treated at the London Hospital, in x only was there no previous history of indigestion. milar figures were obtained in 248 cases of perforated stric ulcer. In hæmorrhage due to a chronic ulcer e same applies. As the majority of these patients d had more than one course of medical treatment, veral had been having intermittent treatment for years and one for 32, we are perfectly justified in nsidering them as failures of that treatment, and, surgery was unable to be employed successfully in ese emergencies, the mortality is medical rather an surgical. This is a view I have frequently pressed, and is one which has also been ably put rward by Sir Berkeley Moynihan,[2] and recently has oked medical criticism; it is undoubtedly correct at the mortality of the medical treatment of chronic cers is vastly greater than the surgical.

DEFINITION AND STATISTICS OF CURE.

I work in the belief that surgery provides in the ajority of cases a cure, and I am now using this term the sense in which it is understood by the laity—that is, a permanent abolition of symptoms. Those of us who have been operating upon large numbers of patients with these diseases have traced their after-history from year to year, and are able to speak authoritatively in the matter. In my Hunterian lecture[3] in 1920, I gave my reasons for considering those patients as cured who had gone two years without any symptoms whatever. I wish to emphasise this. None of those who came within that category and were then quite well have had further trouble. Three men, however, among those "not well" developed secondary ulcer, one a true jejunal, and two gastro-jejunal ulcers due to unabsorbable sutures, one after a chronic gastric, and one after a chronic duodenal ulcer. Patients who go for two years without symptoms never develop them later. I have found that in the rare cases of severe symptoms, six, eight, or more years after operation, the first two years were never uneventful.

I want briefly to supplement the records in that lecture, thus bringing the results up to date (to Jan. 1, 1924). In what follows I am using the term chronic ulcer to mean an ulcer that can be seen, felt, and demonstrated to others, or, as Moynihan has put it, "a visible and palpable lesion." To that date I had treated by operation 768 cases of chronic duodenal ulcer, with 15 deaths, including those operated on for hæmorrhage, 78 in number, among whom there were six deaths. I have been able to trace 500 who were operated on before January, 1922; 463 are, and have remained perfectly well. In this series, of 152 additional cases, two developed secondary ulcers, one described in that lecture and one I shall mention later. The cases of chronic gastric ulcer, operated upon to Jan. 1st, 1924, number 600 with 28 deaths. These figures include all treated except for acute perforation. I have similarly traced 403 cases, operated on before January, 1922; 311 were and had remained perfectly well; among the additional cases, one developed an anastomotic ulcer and was operated on by another surgeon, and eleven had minor complaints, but they were small. I should like to confirm what I have previously stated with regard to partial gastrectomy.[4] Its results are remarkable. I have been carrying it out regularly for certain cases of chronic gastric ulcer, and enlarging its indications for over eleven years. I have never known secondary ulceration to follow, and its after-history seems to be singularly uneventful.

Among 903 cases of chronic gastric and duodenal ulcer traced for over two years, 774 have remained absolutely well, 29 have developed secondary ulceration. In three of these the second operation was not done by myself. The letters from patients are overwhelming in their gratitude; I will quote one case as an example. In November, 1913, I operated upon a woman of 30, with a 14 years' history of attacks of epigastric pain with occasional vomiting, and one severe bout of hæmatemesis. I found an hour-glass stomach due to recurrent ulceration on the lesser curvature, with much scarring, and did a posterior gastro-jejunostomy to its cardiac side, at the same time removing her appendix. Her husband wrote on Jan. 25th, 1924, saying "whereas before the operation food of any kind resulted in absolute torture for her, she is now able to enjoy good meals and not fear after-effects." It has been my experience that, as with this patient, the remote results continue as satisfactory as the immediate.

PATHOLOGICAL PROOF OF HEALING.

But we have not only the clinical proof, the cure as understood by the laity, we have the pathological, the healing of the ulcer being demonstrated at post-mortem, long periods after the operation, or at second operations undertaken for other conditions. I have always maintained that chronic ulcers of the duodenum, unless adherent to and eroding the pancreas, heal as the result of gastro-jejunostomy, as do free ulcers on the lesser curvature of the stomach when the

[1] Clinical Journal, Sept. 6th, 1911.
[2] Lectures on Gastric and Duodenal Ulcer, 1923, p. 22.
[3] THE LANCET, 1920, i., 691.
[4] Hunterian Lecture, loc. cit.

anastomosis is done to their cardiac side. I have had the opportunity of examining, up to 12 years after operation, 31 cases of chronic duodenal ulcer, and 25 of chronic gastric. The ulcer had healed in all. I have never seen an ulcer unhealed at a remote period subsequent to gastro-jejunostomy, if that procedure was indicated and was carried out on correct lines.

CAUSES OF OCCASIONAL FAILURE TO CURE.

In spite of this, however, we very occasionally fail to "cure" the patient. The failures may be mechanical or ulcerative, both now exceedingly rare. The mechanical, revealing itself by bilious vomiting, is associated with imperfect technique, and failures from this cause become fewer and fewer with experience, but perhaps may be unavoidable on occasions for anatomical reasons, if gastro-jejunostomy is performed. I refer particularly to patients with a short or fat transverse meso-colon, or an ulcer high on the lesser curvature or posterior surface. These cases exercise one's ingenuity, and in them I endeavour to avoid gastro-jejunostomy.

Until we are accurately acquainted with the cause of gastric and duodenal ulcer, secondary ulceration will occasionally occur, although our treatment has brought about the healing of the original lesion. It seems to me hopeful that a further study of the conditions under which secondary ulcer arises may throw light on the ætiology of the primary one. I am firmly convinced that infection is the cause of gastric and duodenal ulcers. The infection may reach the stomach by the blood-stream from the mouth or abdomen or, in the latter case, the lymphatics, as suggested by Braithwaite,[5] in his work on the lymphatic flow from the ileocæcal angle. The association of acute ulcers of the stomach with abdominal infections, particularly from the appendix, is well known and demonstrated post mortem.

ACUTE ULCERS OF THE STOMACH.

Acute ulcers of the stomach are much more common than it is now fashionable to think. I believe the older physicians were right in considering the pain, vomiting, and hæmatemesis of young women due to acute gastric ulceration. These symptoms are not, of course, confined to any age or sex, but are typically met with in women between 20 and 30.

It is true that these ulcers are small, but what is the limit of the size of an ulcer? We should look on these lesions as definitely ulcers, but we must not let this conception of the condition make us advise gastric operations for their cure; we should treat their cause. We know that they usually heal readily and often relapse. They cannot be seen on external examination of the stomach, often not when the mucous membrane is directly inspected during life, and after death may only be discovered with the greatest difficulty, but in all cases of hæmatemesis in patients with this type of symptoms that have died after operation, I have been able to find acute ulcers. During the early years of gastric surgery it was customary to operate immediately on cases of profuse hæmatemesis; it is from experience gained during this period that I make the statement.

I have operated on 63 patients for hæmatemesis of this nature, not due to chronic gastric or duodenal ulcer and presumably due to acute ulceration. Three of the early cases died; in all the stomach itself had been explored at the operation and nothing found, and in all acute ulcers were demonstrated post mortem. These cases in their previous history resembled those who recovered, in whom I was unable to demonstrate an acute ulcer.

Unfortunately, diagnosis is only made possible by hæmorrhage, or very rarely by perforation, so that only in these cases is treatment at present possible. It should be on surgical lines—rest to the diseased part and removal of infection. This would, I am sure, save many from the development of chronic ulcer and the later onset of carcinoma. That acute ulcer is often followed by the chronic variety and the latter by carcinoma is undoubted. The larger my experience of gastric surgery, the more strongly do I hold the view that carcinoma is a frequent complication of chronic ulcer, which should be ever present in our mind when advising and undertaking treatment. Hardly a week passes in which I do not operate on some patient, with a history extending over many years so definite that gastric ulcer could be diagnosed—only to find carcinoma too late for removal. While revising this address I have explored a man with a history of attacks of pain after food extending over many years and diagnosed ten years previously as ulcer, who for the past nine months had had no remission, it proved to be advanced carcinoma; the day previous to this a patient who is the most recent illustration of the connexion, acute ulcer, chronic ulcer, carcinoma.

A woman of 59 came under my care with the following history: At the age of 35 she had an acute painless hæmatemesis of a severe nature. She then had occasional attacks of "indigestion" to which she paid little attention until four years previously, when she began to get definite attacks of pain after food lasting two to three weeks, with intervals of three or four months of perfect health. For three months before I saw her she had had pain every day with occasional vomiting. At operation, on Feb. 12th, I found inoperable carcinoma of the body of the stomach.

The cases of presumably acute ulcers with hæmatemesis should be given morphia and as much water by the mouth as the patient wishes. Such treatment as an ice-bag to the epigastrium, withholding of all fluid by the mouth, is illogical. Patients suffering from the results of hæmorrhage should be kept warm; ice applied to the epigastrium would have the opposite effect, and although it might constrict the superficial vessels it certainly would not have this effect on those of the stomach, rather the reverse. Sucking ice is similarly unwise. There is no reason whatever to withhold water, it can do no harm. Operation should *never* be carried out in these acute cases with hæmatemesis. The acute ulcer cannot be dealt with directly; gastro-jejunostomy cannot check the bleeding and adds enormously to the mortality, which is low. When the bleeding has ceased, every effort must be made to arrive at a diagnosis of the cause; splenic conditions, carcinoma of the stomach, cirrhosis of liver being borne in mind, as they may each cause hæmorrhage without any prodromal symptoms. If acute ulcer is the diagnosis, careful search should be made for septic foci, in the mouth, naso-pharynx, ears, and such dealt with. If no external exciting cause is discovered, the question of abdominal exploration should be considered, and I am of the opinion it is the safest procedure. In any case, if relapse occurs it should not be delayed longer than to give the patient time to recover sufficiently from the effect of the bleeding. Dealing with infection in the abdomen may prevent the formation of other acute ulcers and their development into a chronic condition. I am firmly convinced that this treatment prevents the occurrence of further acute ulcers.

Among these 63 cases explored are 29 in which definite disease of the appendix was present, in 27 no further hæmorrhage took place. In two it recurred within a year, and it is a striking fact that in both these patients the disease in the appendix was only discovered on microscopic examination, to the naked eye it was normal. All these were over three years ago, 13 of them over five. The following is a recent and most striking instance in a boy of 12 who was not restored to health without surgical intervention.

He was admitted to the wards of the medical unit, under the care of the director, Dr. Charles Miller, in January, 1921. He had had a profuse hæmatemesis, with a relapse in three days and a further hæmorrhage the day after his admission. He remained in hospital for three months and then went to a convalescent home for five weeks. He was readmitted in September after a further hæmatemesis, which recurred after he had been in hospital four days. There was no evidence of any external infection; at no time had he had pain or indigestion. As his condition remained unsatisfactory and he was not recovering, I was asked to see him, and on

[5] Brit. Jour. Surg., July, 1923, p. 7.

an. 10th, 1922, I operated; the stomach and duodenum, ver and spleen, were normal. The gall-bladder appeared ormal. I explored it internally, took a specimen of bile. nd removed the appendix, which was thickened and ontained fluid. Films of this showed pus and many acteria. Cultures from gall-bladder were sterile. He is ow in perfect health and started work last August.

The infection may be in the gall-bladder and reated equally successfully. I have previously published [6] examples of acute ulcer, with hæmorrhage and erforation, associated with infection of the gall-ladder, the patients being free from gastric symptoms ow eight and 12 years ago. Previously to January, 922, I had removed the gall-bladder in 11 patients ith hæmatemesis. Since that date I have operated n four and in all cultures of the bile grew colon acilli. In none has there been any recurrence of astric symptoms.

In a large number of cases of chronic gastric ulcer n women we find a definite history of attacks of ainless hæmatemesis and of vague discomfort after od, caused, I believe, by the acute ulcer before the nset of the typical chronic ulcer symptoms. I am f the opinion that treating the acute ulceration when e can diagnose it, in the way I have suggested, will revent the development of chronic ulcer. Not only re the cases I have quoted clinical evidence of my elief, but I have been able to keep some patients nder special observation. I am surgeon to the ursing staff and am thus fortunate, in that I am able o follow up the cases. I have operated upon three urses who had had attacks of hæmatemesis such as attribute to acute ulceration. As there was no xternal cause of infection I explored and removed the ppendix, which was the only obviously diseased rgan. All three have remained well and at work or eight, nine, and ten years. We are not, however, lways successful; we may fail to discover the cause, r be too late in its removal, so that the ulcer may ecur or become chronic. The cause of chronicity we now, from Bolton's experimental work, to be excess f acid and delay in emptying the stomach. Clinical onfirmation of this is obtained from the healing of ronic ulcers after gastro-jejunostomy, when acidity lowered and gastric stasis abolished.

RECURRENT ACUTE ULCER.

There is a variety of ulcer little recognised, met with ost often in women, particularly those with gastric tosis, and frequently associated with repeated ttacks of hæmatemesis; it is the recurrent or relaps-ng acute ulcer, with definite healing taking place etween the attacks. The scarring which results ay produce an hour-glass stomach and in about per cent. of the cases at the time of operation for is condition the ulcer has healed. If not producing eformity the scars are easily overlooked and only evealed on careful search and are usually found close the lesser curvature on the posterior surface of the omach. Unless producing deformity, treatment ould be directed towards other abdominal organs, otably the appendix and gall-bladder, to deal with e causative infection. These ulcers relapse, even hen soundly healed. The following is a good xample: In November, 1913, I operated upon a oman, aged 30, who gave a 14 years' history of eriods of pain after food, with three attacks of ematemesis. I found an hour-glass stomach with a rait which would only admit my index finger. xploration of the stomach revealed no recent ulcera-on, there was much visceroptosis, and I decided would be worth while doing a gastro-gastrostomy; vo and a half years later I had to do a partial strectomy on account of recurrence of symptoms. he specimen showed the anastomosis perfect, with ecent acute ulceration in a scarred area on the posterior rface of the stomach. This patient has remained rfectly well.

What is the relationship that exists between the cute ulcer, the relapsing, and the solitary chronic round ulcer, the last variety so much more common in men, the well-known penetrating type which when situated on the posterior surface of the stomach involves the pancreas? These latter ulcers rarely cause an hour-glass stomach; when one is found in association it is usually due to the scar tissue formed by the healing of relapsing ulcers. I believe that the difference is to be found in the much greater acidity of the gastric contents in men than in women. In women the lower gastric acidity allows healing of the ulcer, the contraction of the scar tissue so produced accounts for the hour-glass stomach. This will explain why this relapsing type is so much more common in women and why hour-glass stomach is so rarely met with in men. I believe that in the true chronic ulcer healing does not take place between the attacks. As evidence of this we have acute perforation, by no means uncommon, or hæmorrhage, when the patient is apparently well. Spread in this variety results in perforation into the free peritoneal cavity, or erosion of the pancreas or liver and occasional hæmorrhage. It is this ulcer which is the precursor of malignant disease. The scars that are frequently found in the post-mortem room are not the scars of this type which destroy all the coats, but those of relapsing or acute ulcers.

I am convinced that they all own one cause and that it is possible, as I mentioned before, to arrest the disease before it reaches a chronic stage when nothing but a direct operation on the stomach is of avail. The following case seems to me to illustrate the development of a chronic ulcer from an acute. I believe that if abdominal exploration had been carried out earlier, as in the case I have quoted, it would have been possible to have prevented this.

In December, 1923, I operated on a girl of 24 with the following history: At the age of 17 she was treated in hospital for an attack of painless hæmatemesis. She had a further attack in 1920 when she was again treated in hospital. In November, 1922, she was once more admitted as she had begun to experience pain after food; her test-meal was then normal. After medical treatment she remained well for a year when she again had symptoms and was again an in-patient. On this occasion her test-meal was free HCl 0·26, total acidity 78, a very marked increase. After admission she had a copious hæmorrhage, vomiting blood on five occasions. At operation I found a chronic ulcer on the anterior surface of the first part of the duodenum which I destroyed by cautery and performed a posterior gastro-jejunostomy. I then looked for evidence of infection; the gall-bladder appeared normal on external and internal examination, but the appendix was fibrotic in its terminal half and the pathological report was chronic appendicitis. She left hospital for convalescent home 14 days later with a test-meal finding of free HCl 0·0 and total acidity 23.

This case seems to illustrate the transformation of an acute into a chronic ulcer with rise in gastric acidity, in spite of medical treatment under the best possible conditions.

It has fallen to my lot on several occasions to have to explore on the diagnosis of ulcer and find none, only to have to re-operate a few years later and discover a large ulcer. The following is an example:—

In October, 1915, I saw a woman of 31 with a history of attacks of pain of three to four weeks' duration with free intervals of about a month, which had extended over three years. Test-meal normal, free HCl 0·09, total acidity 49; barium meal negative. I explored and found a suspicious scarred area on the lesser curvature, but no definite evidence of ulceration. I therefore opened the stomach widely on its anterior surface and searched with a head light and speculum. I could discover no ulcer. I removed her appendix which was bound down at its base and contained a soft concretion; my note says, "but was otherwise normal." Microscopical report—"slight submucous fibrosis and muscular hypertrophy of tip of appendix." She remained well for a year, and her symptoms recurred and for the eight months before she again came to see me she had had pain and vomiting. Her test-meal showed increase (free HCl 0·12, total acidity 60) and the barium meal a penetrating ulcer. Two years after the first operation I did a partial gastrectomy for an ulcer on the lesser curvature and posterior surface which was eroding the pancreas posteriorly for an area of 1 by ¾ inch. On examining the part removed I found a linear scar where I had opened the stomach, far removed from the ulcer. She has remained quite well.

[6] Lectures on Stomach and Duodenum, 1921, p. 12.

This case is an example showing that the relapsing type of ulcer may become the chronic.

I have also had to operate on several patients who had been explored by others for hæmatemesis and after a lapse of years found a definite chronic gastric ulcer. Similarly, I know of two patients of my own whom I explored for ulcer on account of hæmorrhage and in whom, similarly, a chronic ulcer was found by other surgeons.

HOUR-GLASS STOMACH.

To pass now to a further consideration of a subject I have already mentioned, hour-glass stomach. It is astonishing that carcinoma so rarely supervenes on this condition. Thus, among 119 cases of hour-glass stomach operated upon up to Jan. 1st, 1924, there were only four cases of carcinoma, all women. In three of these the history pointed to it having followed on chronic ulcer. One case is unique in my experience; there were two chronic ulcers, one on the lesser curvature about an inch from the pylorus producing a large pyloric pouch and obviously malignant, and one high up on the lesser curvature with a small cardiac pouch. I successfully carried out partial gastrectomy. The report on the specimen by Dr. H. M. Turnbull showed that carcinomatous change had started in a simple ulcer and that the other ulcer was wholly innocent. In none of the 83 cases in which partial gastrectomy was carried out for hour-glass stomach due to what was diagnosed as simple ulcer was carcinoma discovered on microscopical examination. The great rarity of hour-glass stomach in men is striking. I have already mentioned what I considered the explanation of the frequency of this condition in women. Among the 114 cases of hour-glass stomach due to ulcer, only 12 were men, a very marked difference to the usual incidence. Thus, of 600 cases of chronic gastric ulcer operated on to Jan. 1st, 1924, 372 were men.

There is another point in connexion with hour-glass stomach in women: chronic duodenal ulceration is not infrequently found associated with it. The combination of the two is relatively no more often met with in women than in men, when looked at from the gastric ulcer standpoint; thus in 55 of my gastric ulcer cases duodenal ulceration was also present—30 men and 25 women. But we must remember that chronic duodenal ulcer itself is infinitely more common in men; thus of the 768 cases of chronic duodenal ulcer, 130 only were women, and it is striking that in the 25 of these in which gastric ulcer was present, an hour-glass stomach had been produced. In none among the 30 men was this complication found. I am under the impression that, as with acute appendicitis, ulcer is becoming a more common disease in women. Thus, in my first 100 cases operated on for chronic duodenal ulcer there were 16 women, in my last there were 27. A similar change is noted in chronic gastric ulcer. In my first 100 cases, 67 were men, in my last 100 only 59. It is difficult not to associate this with a similar striking change in the sex incidence in acute appendicitis. Thus, in the year 1922, 625 cases of acute appendicitis were operated on at the London Hospital, 278 were females (44·5 per cent.). In 1907, 311 cases were operated on; 109 (35 per cent.) only were female. I have taken only the acute cases, as in these there can be no dispute as to the diagnosis. Rendle Short,[7] in his paper on the causation of appendicitis, has also noted this. He wrote: "There used to be a marked disparity between the sexes, males being more liable. Many early figures gave the proportion as 3 males to 1 female. Of late years the difference has been less marked. In 1918, 1298 males died of the disease in England and Wales, and 1118 females."

It is not, I think, generally recognised that gastric and duodenal ulcer is often familial, and, although it is not using the term strictly correctly, hereditary. I have no doubt upon the subject, but Bolton[8] says there is no satisfactory evidence, although he quotes Dreschfeld[9] on the subject, who regarded the evidence as conclusive. I have many times operated on individuals of the same family, on several occasions after fatal disaster had happened to another member, from perforation, and have more often obtained a definite history of operations for the same condition in others. I think it unlikely that it has to do with the stomach itself, as in one member of the family the ulcer may be gastric, in another duodenal. I think the reason must be sought in the exciting cause. I have recognised for many years that disease of the appendix tends to run in families, father or mother, and then the children. I have operated on parents and children for acute appendicitis, not in an epidemic form but with the lapse of years. I have always looked upon this as being the result of some inherited anatomical peculiarity of the appendix tending to inefficient drainage, hence increasing the liability to infection. There can be now, at any rate among surgeons, no hesitation in accepting infection from the appendix as a cause of gastric and duodenal ulceration, and it appears to me that we have here the probable cause of the prevalence of ulcers in members of the same family. I have recently had a son sent to me, to be operated on for chronic ulcer at the age of 24, by his mother, upon whom I carried out partial gastrectomy for carcinoma 13 years previously, after she had had symptoms pointing to chronic gastric ulcer for 27 years, and many cases in which parents I had successfully operated on sent their children to undergo the same treatment. I have also had several cases in brothers and sisters; one that created a deep impression on me was an instance in which I did a partial gastrectomy for hour-glass stomach in one sister, the other was brought to me and at operation I found carcinoma had developed. The elder sister I operated upon in November, 1919. She was 38 years of age and gave a 21 years' history of attacks of pain after food. I found an hour-glass stomach due to an ulcer on the lesser curvature, extending to the posterior surface and eroding the pancreas, with much scarring on the anterior surface, with a large pyloric pouch from stenosis caused by a chronic duodenal ulcer. I did a partial gastrectomy and she has been in perfect health since. She sent her sister to me last March. She was 31 years of age with a ten years' history of attacks of pain after food which for the previous six months had continued without remission. I found inoperable carcinoma of the stomach. It is interesting to compare the two end-results and to speculate on the reason for their difference: the gastric ulcer in the one case leading to an hour-glass stomach, in the other carcinoma. Were we able to solve this problem we should be very near victory over malignant disease.

SECONDARY ULCERATION.

Unfortunately, we have sometimes the opportunity of tracing the development of a chronic ulcer in the secondary lesion that may arise after gastro-jejunostomy. We know that at the time the anastomosis is made there is no ulceration in the jejunum. We also know from the classical animal experiments of Bolton that in order to produce gastric ulceration there must be damage to the mucous membrane and a certain degree of free acid in the gastric contents, and that the healing of these may be delayed and the lesion become chronic in the presence of an excess of free HCl. The damage to the mucous membrane of the jejunum may be brought about by infection that we failed to treat at the original operation. Another form of damage is the use of unabsorbable suture and bruising by clamps. But I do not believe that any of these, except the use of unabsorbable sutures, is sufficient in itself. If the operation permanently abolishes free HCl in the gastric juice, chronic ulceration does not occur. I drew attention to this in my Hunterian[10] lecture and, for reasons there given,

[7] Brit. Jour. of Surg., October, 1920, p. 174.
[8] Ulcer of Stomach, p. 15.
[9] Allbutt: 1910, vol. iii., p. 449.
[10] THE LANCET, 1920, i., 691.

onsider it an important cause. I think there is no oubt that a large opening removed from the pylorus roduces the greatest lowering of gastric acidity, and nterference with the pylorus by exclusion, or the resence of adhesions, is an important factor in eeping up the post-operative acidity. I am a whole-earted believer in the "physiological," or, as I prefer o call it, the chemical action of gastro-jejunostomy, s opposed to the purely mechanical. In a discussion t the Harveian Society,[11] I pointed out that if the ost-operative test-meal showed little or no reduction f acidity, although the stomach may be emptying apidly through the new opening, the patient may have urther digestive trouble. It is a subject at which I m still working but I can give a few results. First, will relate a case.

In March, 1920, I operated on a male patient aged 52. found a large ulcer of the first part of the duodenum with perforation at its centre closed by the gall-bladder which as definitely thickened. I separated these adhesions and losed the perforation. His condition would not allow any rther treatment. His pre-operative test-meal was free ICl 0·18, total acidity 75, his post-operative, free HCl 0·17, nd total acidity 63. At the present time, in a case of this ature, I should as soon as possible deal with the affected all-bladder and remove the appendix. He remained well for wo months only and then began to get the pain typical of jejunal ulcer; to the left of the umbilicus late after food, aking at 2 or 3 A.M., and relieved by food. I had him under bservation in September of the same year when his test-eal was free HCl 0·19, total acidity 79, and the barium eal report suggested ulcer at the stoma. I kept him in ed on alkalies, atropine, and diet, and at the end of three eeks he considered himself quite well and there was a slight owering of gastric acidity. Three months later the same ymptoms recurred and his test-meal was free HCl 0·18, otal acidity 70. I therefore re-operated on June 21st, 1921. found the duodenal ulcer healed and a chronic ulcer on the nterior surface of the jejunum. I did a partial gastrectomy; e had an uninterrupted recovery and his test-meal three eeks later showed free HCl 0 and total acidity 10. In his particular case the pylorus was interfered with in suturing he perforation and there was a definite focus of infection.

That increased gastric acidity is a most important actor in the development of secondary ulcers is ertain. I will briefly give you the reasons for coming o this conclusion. In the first place there is the great arity, as I have previously pointed out, of jejunal or astro-jejunal ulcer in women; it has only arisen in hree of my cases, in two it was directly due to a silk uture, in the third catgut only had been used, and the econd operation was carried out by another surgeon. ts very great rarity after operations for gastric ulcer n both sexes is also well known; I have only seen ne true jejunal ulcer. It occurred in 1911 in a male atient, aged 29, whose gastric acidity was higher fter operation than before, free HCl 0·11, total cidity 52, to free HCl 0·16 and total acidity 64. The peration had been difficult. I excised a chronic ulcer rom the centre of the lesser curvature and then did gastro-jejunostomy, and I noted that I was not atisfied with the size of the new opening. The ylorus was not excluded nor the appendix removed. hree months after the original operation I excised jejunal ulcer and removed his appendix, but his cidity remained high, free HCl 0·13 and total acidity 0, and I heard in 1920 that he had had a recurrence. he rarity of any variety of secondary lesion after peration for chronic gastric ulcer is, I think, explained y the lower acidity met with in this condition and to he fact that the post-operative acidity is very markedly educed in a large percentage of cases. Thus, in 123 ost-operative test-meals, after simple gastro-ejunostomy for a chronic gastric ulcer, in 99 there vas an absence of free HCl and a low total acidity, n 15 it was much diminished, in eight reduced to ormal, in only one not reduced—the case I have uoted.

To turn now to chronic duodenal ulcer. To the end f the year 1922 I have notes of pre- and post-perative test-meals on 285 cases of chronic duodenal lcer; 37 of these showed little or no reduction in gastric acidity, and in all of these except 11 I had made a special note of some abnormality, the most common being adhesion to the gall-bladder or liver (17 cases), opening nearer pylorus than usual (3), smaller than usual (2), ante-colic operation (1), bruising around anastomosis (clamp) (3). Seventeen have had further symptoms—five jejunal ulcers. In 131 cases free HCl was absent and the total acidity low; not one of these has had any return of symptoms. There are 65 cases in which there was very great reduction, but not to the abolition of free HCl; these are all perfectly satisfactory. Fifty-two in which it was reduced to normal; while most of these remain quite well, symptoms were present in five but none developed a jejunal ulcer. We have here, I am sure, material bearing very directly indeed on the production of ulcers, and it shows beyond a doubt how bound up it is with the question of gastric acidity. That there is some specific cause acting in the formation of jejunal ulcers is obvious from the fact of their frequent recurrence if they are simply excised, just as we know the frequency with which a chronic gastric or duodenal ulcer, which has perforated, will give rise to further symptoms, sometimes even to a second perforation with fatal results, unless curative measures are adopted. To prevent the occurrence of secondary ulceration all infective foci should be dealt with, no unabsorbable material or jejunal clamp used, and a large anastomosis made removed from the pylorus—in this way I have been able to reduce the incidence of this complication to the very small figure of 2 in 276 consecutive cases of gastro-jejunostomy for chronic ulcer, operated on more than two years ago.

I have tried to emphasise the importance of recognising and thoroughly treating acute ulcers, so that the onset of the chronic type may be prevented, and to point out that although by surgery chronic gastric and duodenal ulcer can be treated with little risk and a high percentage of cure our aim should be to prevent their occurrence.

[11] THE LANCET, 1923, i., 653.

Lettsomian Lectures

ON THE

TREATMENT OF

PULMONARY TUBERCULOSIS.

Delivered before the Medical Society of London

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LECTURE II.

(*Delivered on March 5th.*)

DIFFICULTIES in diagnosis are not the only problems which confront us in the management of a case of pulmonary tuberculosis. To determine the value of any method of treatment is a matter of singular difficulty. This is intelligible when we consider the long course of many cases, showing periods of activity and relative quiescence. The tendency to spontaneous arrest also complicates the decision as to the efficacy of a given mode of treatment. Moreover, M. L. Renon writes of "a normal coefficient of improvement" for any remedy, due largely to the psychic effect upon the patient. A most striking illustration of this is afforded by the observation of Mathieu and Dobrovici in 1906. They prepared certain patients for what they described as a valuable new remedy for the disease, and after careful records and the usual preparation accorded to patients undergoing a new treatment on its trial they gave daily injections of 1 c.cm. of normal saline, to which they gave the high sounding name of "anti-phymose." The results were strikingly similar to those we are accustomed to see recorded in the earlier

days of any new treatment. There was a marked amelioration of symptoms, fever abated and even an actual gain of weight occurred. Even in animals it would seem that it is easy to assume too hastily that a treatment is beneficial. Dr. E. H. Kettle, in a recent paper,[1] has urged that the criteria of cure in experimental animals like the guinea-pig, require more rigid analysis than they sometimes receive.

In view of these significant observations, which should be known and recognised as widely as possible, it is important for us all to adopt a critical attitude of mind in regard to any treatment and to moderate our enthusiasm until it can be demonstrated that it gives results superior to the "normal coefficient of improvement." We must avoid the attitude of the old lady who said, "It must be good, my dear, the advertisements speak so well of it" and adopt the Hunterian maxim, "Prove all things, hold fast that which is good." Judged by this standard many forms of treatment which have had more than an ephemeral vogue should be discarded. At the same time it is wrong to adopt the attitude that every treatment, other than that of the therapeutic triad, air, food, and rest is useless. Bearing in mind these considerations we may now briefly consider various forms of treatment which have been recommended.

SPECIFIC FORMS OF TREATMENT.

(*a*) *Tuberculin.*

Probably no remedy in the whole realm of therapeutics has been so widely debated as this. Since its introduction by Koch in 1891, it has been the subject of waves of enthusiasm and of depreciation. It has probably suffered more from the intemperate zeal of some of its advocates than from the criticism of impartial workers. That it has failed to realise the hope that it would be a specific cure for the disease there can be few to deny. On the other hand, that it can be a useful agent in treatment is well established. It is significant that it is in the localised or surgical forms of tuberculosis that it seems to have given the best results, while in the pulmonary forms of the disease it has proved most disappointing. Numerous attempts to modify it have been made and the list of products derived from the bacillus and from its culture media, which have been employed, is a very long one. Without any attempt to be exhaustive I have obtained a list of over 80 of these products. It is worthy of notice that in the treatment of the surgical forms the varieties of tuberculin used are few and are chiefly the early products of Koch—namely, old tuberculin, T.R., and B.E.—either of human or bovine origin. In pulmonary cases it has been found that a high degree of tolerance to tuberculin may be induced by administration of this substance to patients without cure of the disease; indeed, this tolerance may coexist with progressive activity of the pulmonary lesions. The reasons for these discrepancies are still obscure, but it is tempting to try to explain them in terms of the views on the pathology of the disease to which I referred in my first lecture. The surgical form corresponds to the secondary stage, when the immunity responses may be incomplete and tuberculin may be helpful, whereas in the pulmonary forms, as shown by Sir Almroth Wright, the hæmobactericidal power may be high, but the local condition may be active, and it may be, as he suggests, that the more fruitful line of attack may prove to be by increasing leucocytic activities.

Practically all tuberculins fall into three groups: (1) The soluble products of the growth of the tubercle bacillus, in various media, the exotoxins, of which the type is Koch's original old tuberculin (T.); (2) the insoluble residues of the bacterial bodies after extraction, of which the type is T.R.; (3) mixtures of both of these, such as B.E. More recently Much and Deycke have fractioned the bacillus in different ways and obtained different substances, which are called partial antigens or partigens. In treatment either the bovine or human forms of tuberculin may be used, and some authorities start with bovine and go on afterwards to human. Friedmann prepared a vaccine from bacilli from the turtle, which has been tried extensively in Germany and America. There seems little doubt that it has no advantages over other forms; indeed, Fishberg classes its results as entirely analogous to those of antipnymose, and therefore simply due to the psychic effect of a special treatment.

Effects of Tuberculin.—Tuberculin when injected into a person who has never had tuberculosis or been exposed to infection is a non-toxic substance. When given to those who have been infected or are allergic a tuberculin reaction occurs. This consists of three distinct effects: (*a*) A *local* reaction at the site of inoculation, which varies from transient redness and swelling to extensive infiltration of the subcutaneous tissue followed by softening. (*b*) A *focal* reaction at the site of the lesion, demonstrated by reactive changes, such as pain, hæmoptysis, increased sputum, and even by demonstrable alteration of physical signs. (*c*) A *general* or systemic reaction evidenced by fever, malaise, headache, and other indications of intoxication.

There are two chief methods of employing tuberculin for therapeutic purposes. In one of these it is given in increasing doses at intervals of from three to ten days. In this method reactions are expected, but they are kept within moderate degrees and are used to determine the amount and the spacing of successive doses. The object is to achieve a high degree of tuberculin tolerance. This is probably the more effective method in localised or surgical tuberculosis, but it is not devoid of danger in pulmonary cases. The other method is to start with very small doses and not to increase the dose till the patient is immune to that last given. In this method reactions are avoided as far as possible, and tuberculin sensitiveness is retained. This, in my opinion, is the only safe method in pulmonary cases. The doses are usually measured in milligrammes, as described by Koch, or in cubic centimetres of the original fluid supplied by the makers. Riviere and Morland suggest the use of the cubic millimetre as the measure of dosage, a method which has definite advantages. The preparation of dilutions is easily effected by means of a series of sterile amber-coloured glass bottles. Into each of these 9 c.cm. of a 0·8 sterile solution of sodium chloride in water containing 0·5 per cent. of phenol is placed. To the first of these 1 c.cm. of the original tuberculin solution is added. After thorough admixture 1 c.cm. of the resulting 1 in 10 dilution is put into the second giving a 1 in 100 dilution and so on. The sixth bottle will contain a dilution of 1 in a million and 1 c.cm. of this fluid would be equal to 0·001 c.mm. of the original fluid. Since the various tuberculins as supplied differ in strength this dose would be equivalent to 1/1000 mg. in the case of T., B.F., or A.F. 1/100,000 mg. of T.R. and 1/500,000 mg. of B.E. In the case of the second method of using tuberculin, these are suitable doses to commence with. Those who use the first method often commence with much larger doses, even as large as 0·5–1·0 c.mm. of the original fluid.

Tuberculin has been given by the mouth, by the rectum, by nasal insufflation, and by percutaneous inunction. The only reliable method is by hypodermic injection under ordinary aseptic precautions, although in gland cases good results are on record from inunction.

Partial Antigens and Defatted Vaccines.—The observations of Deycke and Much are of great interest and deserve more attention than they have received in this country. In the first instance by treating the bacilli with lactic acid they obtain two fractions: (1) referred to as M. Tb. L., which is soluble and contains the toxin partigen; (2) referred to as M. Tb. R., which is the residue. This they fraction further into three parts called respectively A., F., and N. A. represents the protein fraction, F. the fatty acid lipoid mixture, and N. the neutral fat, wax, fatty alcohol group.

[1] THE LANCET, 1924, i., 68.

In treatment they use either the mixture M. Tb. R. or the three partigens A., F., and N. either singly or in varying combinations. The method as employed by Much is somewhat complicated.[2] He first determines the patient's sensitiveness to M. Tb. R. and to A., F., and N., by intracutaneous tests. He then gives daily injections of A., F., and N. in the proportions these tests demonstrate to be necessary, increasing the dose gradually. Then after an interval of two or three weeks further tests are carried out and a further course of partigens in appropriate strength and proportions is given. Much claims that by this method the toxic factor M. Tb. L. is removed, whereas it is retained in the ordinary forms of tuberculin. More recently he has suggested that some of the beneficial effects of treatment by bacterial fractions are non-specific. His method has been extensively used in Germany by various observers, notably Klare, Altstaedt, and Ott. The statistics recorded are contradictory, some describing excellent results, others, like Ott, maintaining that the method has no advantages over tuberculin.

A recent modification of tuberculin, the "diaplyte vaccine" of Dreyer[3] has attracted a considerable amount of notice. Tubercle bacilli are treated with hot formalin and extracted with acetone repeatedly until they are non-acid fast or "defatted." They are then dried and ground with sterile salt solution. After dilution the suspension is centrifugalised, the clear fluid is pipetted off, and the amount of defatted bacillary substance in it is determined. From this stock suspension the doses of vaccine are prepared. This substance is still on its trial, and no definite statement can yet be made as to its value. It seems not to cause the local reaction seen with the ordinary forms of tuberculin.

Other forms of defatted tubercle vaccine have been prepared in Germany—e.g., Uhlenhuth used trichlorethylene for this purpose. As at present used tuberculin seems to have only a limited field of action in pulmonary cases. In general I am more convinced of its power for harm in pulmonary cases than of its usefulness, unless it is given cautiously under such conditions as I have just mentioned. In my experience its chief use has been in cases which have proceeded to arrest, but in whom there is still left a small amount of sputum containing tubercle bacilli. Cautious administration of small doses of B.E. or T.R. avoiding general or focal reactions, if possible, seems sometimes to dry up the sputum and to consolidate arrest. Although it has been recommended in febrile cases, its employment here seems to me irrational, if not dangerous. It is obvious that if it is given in doses sufficient to cause a severe focal reaction or a marked general reaction serious harm may ensue.

It is possible that some modification of the partigen treatment may prove of value in prevention and in treatment, but it must be confessed that at present the omens in regard to tuberculin treatment in pulmonary cases are not favourable.

(b) *Serum Treatment.*

Many attempts to afford some degree of passive immunity by serums have been made, but so far the results seem to have been even less encouraging than those of tuberculin. I find no less than 18 different serums mentioned. The earliest of these is that of Maragliano, first used in 1895 but now discarded. Marmorek's serum was introduced in 1903 and was tried in this country for a time. Recently, considerable notice has been given in the lay as well as in the medical press to the treatment proposed by Mr. Spahlinger, of Geneva. Full details of his method have not been published, and certain of the processes used in the preparation of his remedies have hitherto been kept secret. In so far as his treatment has been described by him, it consists of two forms, one of which, the antitoxin, is primarily intended for the acute cases, while the other involves active immunisation and is carried out by bacillary extracts or vaccines prepared by special processes. The "complete serum" is said to be both antitoxic and bacteriolytic, and is made up of several "partial serums" derived from horses treated with various toxins separated from the tubercle bacillus and its products, together with some serums obtained by inoculation of horses with certain secondary organisms. In the vaccine treatment four distinct vaccines are employed, each given in a separate course, the treatment being spread over several months. From various causes there has been great delay in preparing the complete serum, and restrictions and difficulties have been placed in the way of its widespread trial. A certain number of cases have been recorded apparently showing encouraging results, but sufficient data are not yet forthcoming to allow of a critical examination of the value of this treatment.

Quite recently Uhlenhuth has prepared a serum from cattle inoculated with large doses of avirulent tubercle bacilli, and this has been used by Czerny in 20 cases of severe tuberculosis of the lung with good results.

Spengler's I.K. treatment may here be mentioned. It is made from the red blood corpuscles of rabbits immunised with the *Bacillus humano-longus*. They are freed from protein and pigment and used in lactic acid suspension. This treatment now has very few adherents in this country.

Secondary Infections.

The rôle of secondary infections in this disease has been much discussed. It has been supposed that secondary organisms might play an important part in the breaking down of tuberculous lesions and in causing the symptoms associated with them. This is now generally regarded as incorrect, the tubercle bacillus being held responsible for all of the manifestations of the disease. Examination of the sputum of tuberculous patients often shows other organisms besides the tubercle bacillus, notably streptococci, pneumococci, staphylococci, Pfeiffer's bacillus, the *Micrococcus catarrhalis*, *Micrococcus tetragenus*, and Friedländer's bacillus. It is difficult to determine whether these, when present, play any active pathogenic rôle. Autogenous vaccines made from these frequently seem to have little effect. On the other hand, there are cases in which they appear to act almost dramatically. Dr. R. C. Wingfield has published an interesting note on this subject.[4] He points out that there is a type of case in which an autogenous vaccine is well worth trying. The patient generally has chronic disease, frequently rather extensive, and at intervals of a few weeks gets pyrexial attacks lasting four or five days, not apparently due to tuberculous auto-inoculation. Dr. Wingfield has usually found a streptococcus in these cases, and has had good results from vaccine treatment. He also suggests their trial in cases which "hang fire." I can confirm these observations and I also advise the use of vaccines in cases with marked catarrhal or bronchitic signs. The subject has recently been discussed at the French National Congress at Strasbourg[5] and seems worthy of further investigation.

Graduated Exercise and Graduated Labour.

This question may be considered here, since it has been suggested that some of the benefit of this mode of treatment is due to the effect it has upon the immunity processes by producing controlled auto-inoculation. The usual forms of exercise prescribed at sanatoria are walking and certain games. At all of them the walks can be graduated in length and at many of them also in the matter of level. Dr. Paterson's scheme of graduated labour, first introduced at Frimley and still followed there, was a useful advance. It had the great advantages that it employed the arms, gave interest and encouragement to the patients, and in

[2] Tubercle, 1921–2, ii., 25: also Intern. Centralblatt für die gesamte Tub. Forschung, 1920, 14.
[3] British Journal of Experimental Pathology, 1923, iv., 46.
[4] THE LANCET, 1923, i., 66.
[5] Ve Congrès National de la Tuberculose, Strasbourg, June 2nd–6th, 1923.

some cases served to prepare them better for return to work. The grades of labour are started when the patient has been able to walk up to six miles or more a day. The early grades consist of very light work with periods of rest, such as walking uphill, carrying small baskets, digging with a toy spade, and weeding. It is gradually increased to heavy work with a spade or pick. It cannot be too strongly insisted upon that this method of treatment requires most careful daily observation of the patient on the part of the doctor, and the strictest coöperation on the part of the patient. Over-exercise may be as dangerous as over-dosage with tuberculin, and may lead to active spread and prolonged fever. On the other hand, a small auto-inoculation may have beneficial results if it is at once recognised and the patient put to rest. Malaise, headache, pain, and increased cough or expectoration are subjective symptoms which should at once attract attention and suggest over-exercise, and this may be confirmed by rise of temperature, rapid pulse, and even by altered physical signs. Paterson recommends that if the resting temperature rises above 99° F. in men or 99·6° F. in women, they should at once be put to bed, especially if any of the indications just mentioned are also present. In spite of the criticisms recently directed to this method, I am convinced of its great value in suitable cases, if adequate care and judgment are used in its application.

Other Forms of Exercise.—Golf is often prescribed, allowing at first only a limited swing. In my opinion it is wiser not to allow golf until arrest is complete. Croquet and clock golf are permissible. When the disease is quiescent and the patient is able to take long walks, gentle horse-riding may be permissible. Care should be exercised in regard to games, not only because it is difficult to graduate the amount of exercise taken, but also because of the factors of competition and excitement, which are undesirable. In regard to cycling, rowing, and swimming, special caution is necessary and we should be sure that arrest is complete before permitting them.

CHEMOTHERAPY.

Attempts to find drugs which will have an action upon the tubercle bacillus comparable to that of salvarsan on the spirochæte of syphilis have not been successful. This is not surprising when we remember the resistant fatty and waxy envelope of the bacillus and the avascular character of the tubercles. At the same time, it can be proved that some drugs actually reach the bacillus in the lesions and the search for a true specific is still worth pursuing. Specific chemotherapy in the true Ehrlich sense is therefore as yet lacking, and we must content ourselves with examining whether there is any evidence that any of the so-called "false specifics" exert any direct or indirect beneficial effect upon patients suffering with the disease—in other words, drug therapy rather than chemotherapy.

The Antiseptic Group.

Creosote and Its Derivatives.—Creosote was first suggested in this disease by Reichenbach as long ago as 1830. The experimental evidence of its value is not very convincing. It has only a weak action in inhibiting the growth of the tubercle bacillus, and it has no specific action on this organism, nor does it seem to exert any beneficial influence upon guinea-pigs infected with tubercle. The chief evidence of its usefulness is clinical, and it is significant that whereas it was formerly employed almost as a routine treatment, its use is now more restricted. It seems to be of value in cases of chronic fibroid disease with copious expectoration, in patients with a secondary infection or with chronic bronchitis, and in some early cases with dyspepsia and intestinal fermentation. When given in too large doses, or for too long a period, it may disturb digestion, causing pain, discomfort, and eructations, and it may produce hæmoptysis. According to Dr. Fishberg, it may lead to symptoms comparable to a tuberculin reaction from its effect upon the focal lesions during excretion by the bronchi. It is important that a pure beechwood creosote should be employed. It is best given in capsules or perles, starting with 2 minims after food three times a day, increasing gradually up to 6 minims. It is sometimes given with syrup or balsams, but its hot unpleasant taste renders it disagreeable to most patients. It should not be persisted in if it causes any discomfort or any unpleasant symptoms. The numerous derivatives and compounds of creosote, such as guaiacol (1–3 minims), guaiacol carbonate (10–30 gr.), creosotal (creosote carbonate) 5–10 minims, guaiacol cinnamate (styracol) 5–15 gr., potassium guaiacol sulphonate (thiocol) 5–15 gr., have the same indications and the same actions as creosote. They differ chiefly from it in cost and in taste.

Ichthyol.—Ichthyol (2–5 minims three times a day before meals in milk or water), and its derivatives ichtboform, ichthyol salicylate, and ichthalbin, has been recommended for the same types of cases as creosote and on similar evidence. It is apparently non-toxic and less irritating than creosote. Other antiseptics which have been suggested are phenol, cyllin, and urotropin. The evidence of their value, except as acting on bacteria in the digestive and urinary tracts, is slender.

Iodine.—Iodine requires more detailed consideration if for no other reason than the fact that it has been used so long empirically as a remedy in this disease. The experimental study of its action lends no support to the view that it exerts any specific effect upon the bacillus. It can be shown to reach the tubercles, and it is said to increase lymphocytosis. It also increases the bronchial secretion, and it may induce changes in tuberculous lesions comparable to those produced by tuberculin. It should, therefore, not be used as a routine, or indiscriminately. I have used it considerably and I think with benefit, chiefly in cases of the chronic fibroid type with associated chronic bronchitis, and in some of more active type with slight persistent fever. It is best given as the weak tincture in milk after meals, beginning with one drop and increasing slowly up to 20 drops or more. It should be stopped if it causes any unpleasant symptoms, either as regards the lungs or the digestive system. Curle's "nascent" or intensive iodine treatment may be tried, but is, I think, more likely to disturb digestion. Thirty grains of potassium iodide are given after breakfast in at least half a pint of water to which some potassium bicarbonate may also be added. Chlorine water flavoured with lemonade is given during the day up to 3 to 5 oz.

Dye-treatments.—Various dyes, including methylene-blue, have been used experimentally in animals, owing to the brilliant results obtained by their use in some parasitic infections. An interesting observation[6] has emerged from this work, since it appears that fat-soluble dyes do not easily penetrate tubercle bacilli, while some water-soluble dyes like methylene-blue do so, and that the bacilli are less susceptible to fat-soluble antiseptics, and more susceptible to water-soluble than bacteria with less fat. There is not at present enough evidence of the value of dye-treatment to suggest its use in man.

Cod-liver Oil and Sodium Morrhuate.—Cod-liver oil has long been credited with a beneficial action in this disease, and large quantities, even up to 4 oz. a day, have been given by some French physicians. In this country smaller quantities are usually employed, and it is often given in emulsion or in association with iron or with hypophosphites. Its effects have been variously attributed to its nutritive value, to its vitamin content, and to a possible specific effect upon the bacillus. Sir Leonard Rogers, stimulated by the effects of chaulmoogra oil and the non-saturated fatty acids obtainable from it in leprosy, prepared from cod-liver oil a substance, sodium morrhuate, for use in the treatment of tuberculous disease. It has been shown that chaulmoogra oil contains chaulmoogric and hypnocarpic acids, which are 100 times more bactericidal for the acid-fast bacilli than phenol. Sodium morrhuate has been employed in the treatment of pulmonary tuberculosis, and good results have been put on record by Muir, Knowles, and Davies. Febrile reactions may occur after its use, and occasionally slight hæmoptysis. It is suggested that the effects are comparable to those of tuberculin, and that the bacilli found in sputum after its use show deficient staining and a granular appearance. It is best given hypodermically in the form of a 3 per cent. watery solution, to which half per cent. carbolic acid is added. Small doses should be given two or three times a week, at first 0·1 c.cm. to 0·5 c.cm., increasing up to 1·5 c.cm., watching carefully for reactions. I have used this substance in a few cases, in some with apparent benefit. Sir Leonard Rogers has himself counselled caution in its use, and further trial of its effects both in animals and in man are necessary before its value can be finally assured.

Gomenol.—Gomenol, a distillate from *Melaleuca viridiflora*, has been used in France. It is given subcutaneously in 10 per cent. solution in oil, gradually increasing from 2 c.cm. up to 10 c.cm., and even 50 c.cm. It is given daily for several doses, then a few days' interval is allowed and a further series is given.

[6] De Witt and Sherman: Journal Infect. Dis., 1914, xv., 245.

Pneumosan.—Pneumosan (amyl-thio-trimethylamine), in doses of 4 to 10 minims intramuscularly, had a vogue for a time, but is now rarely used in this country.

Garlic.—Garlic and allyl compounds were recommended years ago by Dr. Vivian Poore, and have been employed again recently. Their action seems comparable to that of the creosote series, and there is no evidence of any specific action.

Hypophosphites and Glycerophosphates.—These have been recommended as general "tonics" in this disease, and are frequently given in combination with certain metals on the basis of the remineralisation theory to which I shall refer later.

Cinnamates.—Landerer recommended cinnamic acid and its salts in the disease. He claimed that it increased leucocytes. Cinnamate of soda is the form which has been used chiefly. Good results have been recorded by various French and Spanish physicians. It is given subcutaneously in doses up to 10 cg. It is now stated to have a hæmolytic action and therefore not recommended.

Metallic and Mineral Substances.—Arsenic seems to have been used in this disease from Greek and Roman times. There is no evidence of any direct action upon the bacilli or the diseased tissues. Any action it possesses in this disease is probably due to its effects upon metabolism. It should be used with care and not as a routine. It may be given as arsenious acid in pill, sodium arseniate, liquor arsenicalis, arrhenal, or cacodylate of soda. The last named is a convenient form. It is given by hypodermic injection in doses of $\frac{1}{4}$ to $\frac{1}{2}$ gr. daily or every other day for about a fortnight, then an interval is allowed and then other courses are given in succession. Salvarsan has also been given with benefit in cases of syphilitics with pulmonary tuberculosis. It is not devoid of risk in other patients.

Mercury Salts.—Mercury succinimide has been recommended by Barton Wright in doses of 1/5th gr. in 10 minims of water given hypodermically every other day till 30 doses have been given. It is said to be specially useful in syphilitic patients. Recent experimental work in animals by De Witt seems to show that mercury compounds exert a favourable action on the disease, and suggest the need for further work on this subject.

Calcium Salts.—Certain French authorities, notably MM. Ferrier and Robin, have attached great importance to a supposed demineralisation in tuberculosis. Calcium salts have been repeatedly used in the treatment of this disease, partly because of the calcification which occurs as one method of cure, and partly because of the legend that those who work in lime dust do not contract the disease. Robin maintained that tuberculosis was associated with an increase, and an alteration of the respiratory exchanges and a demineralisation of the body. He gave fresh bone powder with carbonate of magnesium and of calcium, together with lactose and fluoride and silicate of calcium. Recent work has not confirmed Robin's views, though calcium, especially in the form of collosol calcium, has been used by Prest and others. Considerable claims have been made by Prest as to its value, but some other observers have not been so fortunate. It has the merit of being harmless, except in very large doses. Recently G. Hartwick-Borrman reports favourably of a trial in 600 cases of a comparatively salt-free diet with a teaspoonful before breakfast of a solution of 30 parts of calcium chloride, 60 parts of potassium acetate in 285 parts of water. It should be given in a glassful of warm water, but should be withheld if renal complications are present.

Silica.—Since silica is found in all tissues and more abundantly in connective tissue, silica preparations have been recommended in the hope that they would induce fibrosis. There seems very little evidence, either experimental or clinical of its value.

Colloidal Metals.—Other metals in colloidal form have been recommended in this disease, notably silver, gold, copper, and brass. Although good results have been recorded from some of them, there is little real evidence of their beneficial action.

Organotherapy.—Various organic extracts have from time to time been suggested, including extracts of lung tissue, lymphatic glands, both tuberculous and normal, spleen, and pituitary. Muscle extract or meat juice has also been employed. The fact that most, if not all, of these have been discarded is the best evidence that they are of no real value.

Treatment by Inhalation and by Intra-tracheal Medication.

Inhalations have been used since very early times. They were recommended for laryngeal cases especially by Dr. Coghill and Dr. Burney Yeo, who introduced convenient forms of oro-nasal respirators for the purpose.

Dr. D. B. Lees recommended more or less continuous inhalations, and claimed to have seen cures by this method. He used phenol 2 parts, creosote 2 parts, spirits of chloroform 2 parts, spirits of ether 1 part, and tincture of iodine 1 part. This sometimes causes irritation of the air passages and even slight hæmoptysis, and I have found the formula in use at the Brompton Hospital preferable—viz., menthol 4 parts, oil of cinnamon 3 parts, oil of lemon 4 parts, creosote 20 parts, oil of pine 10 parts, and spirits of chloroform 10 parts. Five to eight drops of this per hour are put on the sponge of the respirator. Although some patients complain of discomfort and difficulty in breathing from the use of a respirator, I have found that the majority find it helpful in lessening cough and expectoration. It is specially useful in laryngeal cases. Kuhn's mask was introduced in 1906. It was devised to induce passive venous congestion of the lung on Bier's principle. It seems to have followed many other ingenious treatments, based on theoretical considerations, into the limbo of the disused. Intratracheal injections have been employed, that most favoured being a mixture of menthol, olive oil, and guaiacol. It is chiefly of use in cases with bronchiectasis, or with offensive sputum, a strikingly uncommon event in this disease.

PHYSICAL METHODS OF TREATMENT.

Heliotherapy.—The striking success of the sun cure of Rollier in surgical tuberculosis has naturally directed attention to its use in the pulmonary forms of the disease.

Rollier admits that great care is necessary in its application in these, but claims that in suitable cases it can be of great value. He suggests that on the first day the feet only should be exposed for two or three minutes, and that the rest of the body should be gradually acclimatised to the sun's rays before the chest is exposed. He also advises that in hot weather, exposure should be limited to the early morning sun. It is generally allowed that if the skin does not pigment after exposure to the sun's rays, the treatment should be stopped. Although some observers have recorded good results from heliotherapy, especially in children, the majority advise against it. It seems not infrequently to cause a rise of temperature, hæmoptysis, and other manifestations of auto-inoculation. It is possible, as has been suggested, that different types of pulmonary disease react in different ways. No case with fever should be submitted to this form of treatment.

Artificial Sunlight.—Exposure to the rays from the quartz lamp has been tried, but unpleasant effects, like those from sun treatment, seem to occur not infrequently in pulmonary cases. Ultra-violet rays have also been employed on the supposition that the beneficial effects of sunlight are due to them.

X Ray Treatment.—This has been tried more especially in glandular tuberculosis, including disease of the bronchial glands. It is often employed as an addition to other forms of treatment, as e.g., by Much, in association with his partigens.

Bacmeister and Kupferle have claimed that radiotherapy can assist in the cicatrisation of tuberculous lesion without destroying the bacilli. They regard it as useless in acute caseous and rapidly developing lesions. The chest is mapped out into areas and carefully measured doses are given. Most observers agree that the tubercle bacillus is not sensitive to the X rays, and that the effects obtained are due either to the changes induced in the tissues irradiated, or to reactive processes produced in the hæmopoietic organs. The chief exponent of the latter view is Manoukhin.[7] He gives regulated doses of X rays of a definite strength and hardness, filtered through 1 mm. of aluminium and applied to the spleen exclusively from the front and back, not from the side, and in such a way that no rays reach the liver. He believes that the beneficial results are due to the leucocytolysis induced, and maintains that the curve of the specific antibodies follows that of the destruction of the white corpuscles. In the first stage of the disease he gives eight to ten applications, in the second 12 to 15, and in the third stage two series of 12 to 15, with an interval of two or three months between them. Trémolieres and Columbian have recorded good results by a similar process, but in addition they apply the rays to some of the long bones. They explain the action of the rays in a different way to Manoukhin, who criticises their technique and their views. These methods seem at least to be worth a cautious trial.

[7] THE LANCET, 1921, i., 685; and Presse Médicale, July 18th, 1923.

It must be confessed that some, if not all, of the much vaunted remedies I have mentioned make but a sorry display when examined critically and experimentally, while most of them fail us in the cases in which we most need help—namely, in those with active progressive disease with fever not controlled by absolute rest. At the same time, a very little may sometimes turn the scale, and provided we are convinced that a treatment does not entail risks, it may be well to give it a careful trial, if only for the encouragement it affords to the patient and the opportunity it allows to the practitioner of giving regular supervision to the details of the patient's daily routine. There is much to be said for the suggestion of M. L. Renon that we should utilise the "normal coefficient of improvement" by employing in sequence various forms of treatment for short periods.

SYMPTOMATIC AND PALLIATIVE TREATMENTS.

In a disease which may take such a long and varied course and in which such distressing symptoms and complications, often harmful in themselves, are liable to occur, palliative treatment may be of the greatest value. Few cases require more skill and resource in treatment than one of chronic progressive pulmonary tuberculosis. We may now consider the treatment of some of these symptoms and complications.

Cough.—An ineffective cough is unnecessary and harmful, and it should be checked. This can often be done by instructing the patient as to the risks of such a cough, and teaching him to restrain it as insisted on by Dettweiler and others. Where it is due to some source of irritation, such as pharyngitis, granular pharynx, some nasal condition or irritation of the base of the tongue, these should be dealt with by appropriate means. Mandl's iodine-glycerine pigment is useful, or some form of sedative or antiseptic spray or nebula. A laryngeal cough is often troublesome, painful, and associated with copious frothy expectoration. Antiseptic inhalations and rest to the voice often help in this case. Simple demulcent lozenges or domestic remedies may be given, care being taken to avoid anything likely to disturb digestion. The sputum accumulated during the night may be viscid and cause sickness after cough, which is commoner in left-sided cases. A cup of hot milk and water or weak tea often relieves this. If this fails a mixture containing 10 gr. of sodium bicarbonate, 3 gr. of sodium chloride, spirits of chloroform 5 to 10 minims, and water to the ounce often gives relief, especially if given with hot water. For nocturnal cough disturbing the patient's rest, some form of sedative is frequently necessary for a time, and of these heroin 1/24–1/12 gr. in a simple linctus, syrup of codein, or collosol bromoform are the most useful. An effective cough should not otherwise be interfered with. When expectoration is copious creosote or some of its derivatives may sometimes be helpful, especially if there is a factor of chronic bronchitis. If expectoration is offensive, antiseptic inhalations may be ordered and creosote or garlic given internally.

Dyspnœa.—This may be due to the extent of lung involved, to mechanical conditions such as pleural effusion, or in the late stages to cardiac enfeeblement. In chronic fibroid cases dyspnœa is often more marked in cold, wintry weather. Rest is often of great value in such cases. If there is a mechanical cause for the dyspnœa, such as an effusion, rest, and if necessary paracentesis, may give relief. Dyspnœa due to extent of lesion and to heart failure is usually terminal, and can only be palliated by rest, oxygen, and cardiac tonics.

Fever.—The treatment of fever is in the first instance absolute rest, in the hope of limiting and eventually controlling auto-inoculations. Where rest fails it is necessary to consider other measures, such as change of room, living and sleeping in a shelter so as to get more air may be tried. Careful hydrotherapy in the form of sponging or packs may help to relieve the discomforts associated with it, but not to deal with the cause. Similarly antipyretic drugs are purely palliative in their effects, and should be avoided if possible. Those chiefly employed are phenacetin, antipyrin, aspirin, quinine, cryogenin, and maretin. The sweating associated with their action as a rule brings nearly as much discomfort as the actual fever. I very rarely use them. When fever persists in spite of rest it is usually wise to consider whether artificial pneumothorax should be tried.

Night Sweating.—These are much less common since the importance of fresh air and free ventilation have been recognised. Rufenacht Walters says "they are nearly always a sign of hygienic mismanagement." This statement is, perhaps, a little too sweeping. When they occur, careful inquiry should be made as to the ventilation of the bedroom, the character of the mattress, and the amount of bed-clothes. Sometimes it is also helpful to sponge the patient before settling him down for the night with hot or tepid water, to which toilet vinegar has been added, and to have a second suit of night clothes ready warmed to put on after the patient has been dried. Paterson[8] recommends placing a grass mat over the mattress and under the sheet on which the patient lies, or else sleeping on canvas without a mattress in cases where the measures first recommended fail. Various drugs were formerly given to relieve this symptom, notably zinc oxide, belladonna, atropine, strychnine, picrotoxin, and agaricin. They are now rarely used, since in most cases they are unnecessary, and our object is to avoid this symptom, not to mask it.

Hæmoptysis.—If there is only streaking of the sputum no treatment is necessary. It it be small in amount—e.g., 2 or 3 oz., rest, some saline aperient, and a dose of bromide to allay the patient's fears may be all that is necessary. In more severe hæmorrhage the patient should be put to bed, lying on his back or towards the affected side, and if it be very profuse he should lie with the head low so that suffocation may be prevented by allowing the rush of blood to escape. The tendency nowadays is to keep the patient less strictly quiet, owing to the observations of Bang that movement has little to do with hæmoptysis, and morphine is less commonly used as a routine treatment on the ground that it lessens cough and tends to cause the effused blood to remain in the lungs and to spread the disease more widely. In a very nervous patient a small dose of morphine, heroin, or codein may, however, do good by allaying anxiety, lessening restlessness, and thus slowing the heart-beat. Nitrite of amyl, 3–5 minims, as an inhalation is worth a trial. Calcium lactate or calcium chloride, 10 gr. in water by the mouth every two to four hours for four doses and then three times a day for two or three days, seems sometimes to be helpful. Calcium chloride can also be given intravenously in doses of 2 c.cm. of a 15 per cent. solution. It has also been given intramuscularly, but for this purpose it requires greater dilution. Where these measures fail, sterile horse serum, "coagulose," and hæmostatic serum may be tried. In cases where repeated small leaks occur, daily hypodermic injections of emetine hydrochloride, ½ gr., may be used. A dose of 5 to 15 gr. of salt by the mouth is said to increase coagulability. A saline purge, preferably sodium sulphate, should be given unless the bowels are freely open. Turpentine has been recommended, and Dr. Jane Walker advises inhalation of this substance at the commencement of the hæmorrhage. The application of ice to the chest is better avoided and the sucking of ice should be restricted to a small amount. Adrenalin and ergot, formerly used by some physicians, should not be employed. The diet should not be greatly restricted, but the food should be given cool, and no alcohol should be permitted. In cases with prolonged or frequently repeated severe hæmoptysis, artificial pneumothorax must be considered, but it requires great care if it be decided to do it while the hæmorrhage is in progress.

Pain.—Pain in the active stages of the disease is usually due to pleurisy. It should be treated by rest and local application of counter-irritants or anodynes, such as blisters, an iodine paint, wintergreen ointment, or belladonna. Strapping the affected side is sometimes recommended, but may cause dyspnœa. In arresting cases pain is sometimes present without pleural signs, and may be due to contraction of pleural adhesions. It may be treated on similar lines.

Digestive System.—Symptoms due to disturbances of digestion are very common. Anorexia is often troublesome, and requires very careful treatment, such as changes in diet and in routine. Dyspeptic symptoms should be investigated and treated on recognised lines by acids or alkalies, bitters and ferments such as takadiastase, malt extracts, pepsin, or papain. Hypochlorhydria is said to occur, and may be a cause of diarrhœa. Dilute hydrochloric acid may then be given in doses of 10 to 30 minims. Dyspepsia may be due to excess of milk or other fatty foods, or to monotony of diet. Diarrhœa may occur apart from tuberculous enteritis, and should be treated by avoiding foods with coarse residues and by giving bismuth, chalk, opium, tannic acid preparations, and salol or other intestinal antiseptics. Constipation requires treatment, especially during the period of rest in bed. It can usually be controlled by diet and by simple laxatives.

Insomnia may be due to too much sleep in the daytime, which can often be obviated by the patient occupying a different bed or room during the day to that used at night. It may be due to cough, pain, or diarrhœa, which should be treated by the appropriate measures. Hypnotics should only be given if other measures fail.

[8] THE LANCET, 1922, ii., 725.

MANAGEMENT OF ADVANCED CASES.

Advanced cases require special care, and where possible they should be treated in special institutions or in nursing homes. Their management is largely a question of nursing, and the treatment of symptoms and complications. Unfortunately they are the most difficult cases to find accommodation for. They are certainly unsuitable for treatment at home in small homes because it is difficult to secure adequate precautions as to infection and to afford proper nursing, food, and treatment. On the other hand, such patients are often averse to leaving home, even when special accommodation is available for them. The duty of the practitioner in charge of such a case at home is a responsible one, because he should be sure that all precautions are taken, and that young children do not come in any contact with the patient. He must also give advice in regard to the disinfection of the linen and utensils used by the patient.

The complications of this disease are numerous and require special treatment and nursing. Among the more important of these are: Tuberculous laryngitis, enteritis, spontaneous pneumothorax, pleurisy with effusion, empyema, peritonitis, and meningitis.

AFTER-CARE, COLONIES, SETTLEMENTS, AND VOCATIONAL TRAINING.

These are all aspects of the tuberculosis problem which are being dealt with by the Ministry of Health, either directly or by the aid of voluntary and charitable agencies. One of the great difficulties in the management of these cases is to map out the best course for the patient when he leaves the sanatorium, especially when he is not able to remain until arrest is complete and consolidated. To return to work under these circumstances and under the conditions which preceded breakdown is generally to court disaster; often in a very short space of time. On the other hand, it is now recognised that to advise a town worker to seek an outdoor or country occupation is usually impracticable and uneconomic. If possible he should return to his former work under better conditions and with a better knowledge of how to live and work, unless that occupation is obviously unsuitable or dangerous. The difficulty is the period between active treatment and full working capacity; when the patient may be able to do some work and yet not able to earn enough to support himself, let alone his family. It is to deal with this aspect of the problem that after-care committees are being encouraged, and that colonies and settlements are being established. The work of Dr. P. C. Varrier-Jones at Papworth Colony is recognised as a pioneer effort of the utmost importance, and Sir James Kingston Fowler, in his interesting and suggestive little book on the Problems of Tuberculosis, accords him a high meed of praise and admiration. This book also includes a suggested scheme for the further organisation and coördination of institutions from the sanatorium to the settlement. The Ministry of Health are dealing with this question in a sympathetic spirit, but it must not be forgotten that there are great difficulties—financial, administrative, and practical. The training of men to new work, their relation to the labour market and to the trade-unions, and the disposal of the products of their labour are all matters requiring organisation and adjustment.

The general practitioner and the physician are also concerned in this question, since they often have to advise patients for whom no such arrangements are forthcoming. The day is past when we can talk vaguely of farming, forestry, market gardening, and chicken rearing as the occupation for arrested lung patients. We have to advise them how they can best earn enough to support themselves under conditions favourable to the maintenance of their health when arrest has been attained. We may have to inquire closely into the nature and conditions of the occupations of our patients, and to advise after a careful consideration of all the circumstances.

From the Royal School of Medicine, Cairo.

BILHARZIAL PAPILLOMATOSIS OF THE RECTUM.

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THE incidence of bilharziasis, from which disease it is estimated that at least 75 per cent. of the Egyptian population have at one time or another suffered, varies in the different districts of Upper and Lower Egypt. The reason for this is at present obscure; it may be the change from the basin or flood irrigation of Upper Egypt to the perennial irrigation of Lower Egypt, or the nature of the intermediate host of the parasite, that is responsible. The type of bilharzia, with terminal spined ova, affecting the urinary system from Upper Egypt, seems to be associated with a less severe type of disease—disease of the bladder, ureters, and renal pelvis in particular—than in the perennial irrigation areas of Lower Egypt. There are regions in the Delta also where simple affections of the bladder alone are most common, and other regions, again, where disease of the ureters and renal pelvis is the rule.

Various Types of Disease.

The district of the Fayoum, one of the oases of the western Desert, is, however, particularly associated with the development of intestinal bilharziasis (*B. mansoni*—the lateral spined ova). The chief seat of this disease is in the rectum, and it is characterised by the formation of numerous papillomata of sizes varying from an orange to a pea. A typical appearance is shown in the appended figure. The lateral spined ova are found within the papillomata themselves and in the submucous layer of the bowel. Bilharziasis of the colon as a whole exists in four types: (1) a simple congestive thickening of the mucous membrane; (2) congestive thickening with papillomata; (3) tumour masses in and around the colon or small intestine with or without local papillomata, and sometimes associated with deposits studded throughout the peritoneum and mesentery (Madden and Ferguson).[1] Polypi of the cæcum are not uncommonly the cause of chronic intussusception, in which the apex of the invaginating bowel is formed by the polypus itself. Ferguson describes a stricture of the large bowel produced by an adult worm encircling the gut and depositing its eggs around the lumen.

Treatment.

The symptoms of rectal bilharziasis are constant tenesmus, with the passage of blood and mucus, whereby the patients are condemned to a life of utter misery, progressive anæmia, and emaciation. Treatment by tartar emetic is successful in destroying the living ova, but the papillomata and the consequent symptoms continue. Local operative procedure by removal of the isolated papillomata by the knife or diathermy is unsuccessful. The papillomata always recur. Injections of carbolic acid 1–20, or various chemical agents, into the bases of the papillomata are equally unsuccessful. The only complete, thorough and permanent cure is obtained by the excision of the whole tube of mucous membrane of the rectum. This has been performed eight times by us, six times by one of us (I. F.), and twice by the other (R. V. D.). The astonishing ease with which the whole unbroken tube of mucous membrane can be excised is most remarkable. Lengths of 12, 15, and 17 in. have been removed by one of us (I. F.),

[1] Madden, F. C.: Surgery of Egypt.

and lengths of 14½ and 9 in. by the other (R. V. D.). A circular incision is made at the junction of skin and anal mucous membrane. Blunt dissection separates the external sphincter muscle without division of its fibres. Two inches of the tube of anal mucous membrane are then easily withdrawn, and the opening of this tube closed by forceps. The attachment of the levator ani forms the next and only other difficulty. When once this muscle is separated by blunt dissection the mucous tube may be loosened by the gloved finger and withdrawn with the greatest ease until the upper limit of the papillomata has been reached.

This operation was first practised by one of us (I. F.) in 1919 and described in a preliminary note.[2] The operation was conceived as a cure for simple prolapse of the rectum when a more complete examination revealed papillomata in the rectum higher up. The presence of the prolapse facilitated

Congestive thickening of rectum with papillomata.
A = Anal margin.

the dissection of the mucous tube. The succeeding seven cases had no prolapse. Two of the cases operated on by one of us (I. F.) were children of 10 and 12 years; the results were even more satisfactory than in the adults.

In the majority of cases the papillomata are limited to the rectum proper and the sigmoid colon is free. The mucous tube is withdrawn—2 in. or so further than the limit of the papillomata, to ensure that there shall be no tension on the tube—and excised, and the edges are then sutured to the margin of the skin and external sphincter muscle.

Recovery is usually uneventful. There is little tendency to retraction of this tube provided that precautions have been taken to avoid tension. Healing takes place as a rule with only a ring of granulations at the anal margin. Control of the anal outlet by the external sphincter muscle is regained in a week. Healing by first intention should not be expected; and dilatation of the sphincter should be practised early to avoid a stricture.

Anatomical Results.

Pathological examination of the mucous tube removed shows that it is entirely composed of mucous and submucous tissue. The muscular coat of the rectum is not removed by this operation. No opportunities have occurred as yet for examination of such cases by autopsy. An operation, however, upon the cadaver performed by one of our colleagues, Mr. A. W. Mooro, disclosed the fact that the sigmoid-rectal junction is brought down close to the anal orifice. On opening the abdomen the rectum was "concertinaed" but there was no intussusception. The musculo-peritoneal tube was very thin. The mucous tube, 15 in. in this case, had been removed from 9 in. of the rectum; thus 6 in. of the mucous tube had been removed at the expense of the redundant folds of rectal mucous membrane. Subsequent examination of our cases with a sigmoidoscope shows a straight tube of mucous membrane without any folds.

Selection of Cases.

A note of warning in the selection of cases for operation should be sounded. The operation is accompanied by some shock, and sometimes by considerable hæmorrhage during the separation of the levator ani attachments. We provide ourselves with long artery forceps, and never operate upon severely anæmic patients, particularly those with a hæmoglobin index of 45 per cent. or under. In the very anæmic and debilitated we have performed a preliminary blood transfusion to restore the hæmoglobin. The operation in Egypt is best performed under stovaine anæsthesia; but some discomfort is complained of when the root of the sigmoid mesentery is pulled upon during the removal of the last inch or two of the mucous tube.

While seven of these cases have been perfectly successful it must be recorded that, in the first case of this series, there was such tension left upon the mucous tube that the sutures gave way and retraction of the tube took place to the extent of 3 in. An intractable stricture developed which necessitated the weekly use of a dilator. The subsequent state of this patient is, however, infinitely to be preferred to the previous condition of tenesmus and progressive anæmia which had rendered his life an utter misery.

In the cases where the papillomatous condition can be seen by the sigmoidoscope extending up to the descending colon, the removal of the rectal portion of mucous membrane, always the most markedly affected region, is sufficient to relieve the urgent symptoms. Isolated bilharzial polypi of the descending colon, the splenic flexure, and the transverse colon may exist with no symptoms but those of a mild chronic diarrhœa.

[2] Fahmy, I.: Proceedings of the Egyptian Medical Society, June, 1920.

A NOTE ON POST-OPERATIVE INSANITY.

BY A. J. COKKINIS, M.B., B.S. LOND., F.R.C.S. ENG.

IN view of the recent discussion at the Royal Society of Medicine on post-operative and puerperal insanity,[1] I feel impelled to make this clinical contribution in the hope of elucidating one or two points in a condition which is obscure and often puzzling. I have a case of post-operative insanity under my care now, and as this contribution is largely based on this case I propose to describe it at length.

The patient is a married woman, aged 60, of good social position and in comfortable circumstances. Prior to the

[1] THE LANCET, Jan. 19th, 1924, p. 129.

operation she had never exhibited the slightest sign of mental instability, but possessed, on the contrary, a particularly steady and reliable intellect. Although she was one of a numerous family, there have been no cases of mental trouble among her relations. She had an abdominal operation ten years ago from which her recovery was uneventful.

Operation.—In October, 1923, her nasal septum was resected under a general anæsthetic. She took the anæsthetic badly, her circulation failed, and at one stage artificial respiration had to be resorted to. She did not recover consciousness for over 24 hours, the immediate post-operative condition being one of profound coma.

Onset of Confusional Insanity.—She then gradually recovered consciousness, but passed on to a condition of acute confusional insanity, without the intervention of a lucid interval. She was noisy, rather violent, did not recognise her husband or her children, had completely lost her memory, and was extremely confused and agitated.

Development of Chronic Dementia.—The acute condition lasted three days and she then passed, by a rather sudden transition, to a state of chronic paranoic dementia, in which she has remained for three months. Her present mental condition can be best described as a complete dissociation of ideas. She has rare intervals of comparative lucidity, during which she seems fairly rational, provided the conversation is kept at a very simple level; at all other times she is totally irrational.

Delusions.—She is full of the most extraordinary delusions, which change and swing about like the pattern of a kaleidoscope. Thus, one moment she attributes her condition to a dog-bite, the next to a cat-bite (!), and the next to worms eating into her wrists. Within two minutes her Christmas dinner passes through the phases of turkey, rabbit, beef, lamb, chicken, ham, and other things. In the same sentence she gives the date of her birth as 1891 and 1999, and she has completely lost the ability to do the simplest arithmetical sums. Her daughter is her sister and her sister is her daughter; she is pregnant at one visit, burying her baby at the next, and so on. Her delusions are seldom systematised, but her entire mental life is strung on delusions, which vary from one minute to the next, and to explain which she invents other and more extravagant delusions. Her sensation and perception are good, but memory she has none. Neurological examination reveals nothing abnormal and her general health is very good.

Quite recently I had the benefit of seeing the patient in consultation with Dr. R. H. Cole. He expressed the opinion that the case was as unique as it was instructive, and that it could not be explained away as an instance of a purely functional psychosis following operation. The clinical picture and the absence of a family or pre-operative personal mental history, coupled with the sudden onset of mental trouble immediately after operation, point to an organic basis for the mental disorder.

The clinical condition strongly suggests a definite interruption of idea-association impulses, such as might take place as a result of minute focal hæmorrhages or thromboses destroying certain association fibres in what are known as the silent areas of the brain. This ætiological hypothesis is strengthened by the possibility of vascular trauma in the cardiac and respiratory trouble experienced during the anæsthesia, and by the prolonged period of coma after the operation.

Such an ætiological hypothesis appears worthy of consideration in certain cases of post-operative or post-traumatic insanity, where gross brain injury and psychical or toxic causes are absent, and where the mental trouble asserts itself immediately after the operation or injury. Should the foci of vascular lesions implicate the comparatively small section of brain matter of neurological importance (motor area, visual centre, &c.) this would be demonstrated by a neurological examination. But in that great field of brain matter known as "association areas" a lesion is incapable of neurological proof, and we are perhaps too prone to make use of purely functional arguments in attempting to explain the ætiology of traumatic or post-operative insanity which is not associated with physical signs of nervous injury.

I am greatly indebted to Dr. Cole for his help in solving the problem presented by this case, and for his kind permission to publish it.

Ilford, Essex.

A SIMPLE METHOD OF PREPARING HANDS AND GLOVES FOR OPERATION.*

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PART I.—(G. W. T.).

OWING to the very wide variations in the directions given by the different authorities as to how the hands should be prepared for surgical operations an attempt has been made to formulate a safe and simple method. The object of this paper is to contend (1) that rubber gloves may be easily sterilised without resort to heat; (2) that it is illogical and unnecessary to wash socially clean hands before operating; (3) to advocate the doctrine of "abstention."

Gloves are usually sterilised by boiling or the autoclave. The boiling of gloves is quite satisfactory and easily carried out, but it slowly destroys the elasticity of the glove, so that it soon ceases to fit. When a puncture occurs in such a glove a definite hole results, which allows of the escape of fluid. If the gloves have been put on out of antiseptic the fluid which escapes at first will be harmless. But antiseptic in contact with the skin soon gets destroyed, and the puncture permits the escape of an emulsion of bacteria. The second method necessitates the use of an autoclave, and is only available to those on the staff of a hospital. So hard is the steam on the gloves that they perish after being used three or four times. These gloves lose their elasticity after being sterilised once, and an ordinary needle-prick then makes a considerable hole.

As a result of frequent experiment we claim that however a smooth rubber glove be contaminated it can always be made sterile by a simple washing with soap and water, followed by a thorough rinsing in antiseptic. The gloves should always be treated on the hands and fit well. They should be washed for one minute with soap and water, rinsed in water, and then rubbed well together in a 1-1000 solution of biniodide of mercury. If dried blood, vernix caseosa, or similar material is on the gloves they should be scrubbed with an ordinary scrub brush till clean, rinsed, and treated with antiseptic. A glove so treated retains its elasticity for two months or more, so that an ordinary needle puncture is so small that it is only with difficulty that fluid can be squeezed through it. It is perfectly obvious that if it could be guaranteed that the glove would not be punctured it would not matter how dirty the hands underneath were. Unfortunately no such guarantee can be given, and it is therefore necessary to define the minimal safe procedure for preparing the hands.

The only logical reason for scrubbing the hands is based on the assumption that the organisms on the surface of the hand are different from those in the glands and are more dangerous. Clearly they consist of three groups: (1) those from the air, which are assumed to be harmless; (2) those picked up when touching surrounding objects; (3) those from the ducts. It is those in the second group that are potentially dangerous. Undoubtedly unwashed hands are a source of great danger if they are allowed to come into contact with virulent organisms through touching any form of septic material. If, however, one no more dreams of introducing the uncovered hand into any cavity of the body than of introducing fæces into the peritoneal cavity, and if one never does a

* Being an extract from a paper read before the Royal Academy of Medicine in Ireland (Obstetrical Section), to be published in full in the Journal of Obstetrics and Gynæcology of the British Empire.

septic dressing, nor even touches the surrounding area of a wound with ungloved hands, whence are the pathogenic organisms to be gathered? Apart from the fact that quite a considerable number of surgeons operate without gloves, it is almost impossible to trace a single case where an infection of a surgical wound can be traced to the hands of the operator. Colonel S. T. B. Williams (late I.M.S.) allows me to say that he performed major operations for years in India without using rubber gloves. Neither he nor his Indian orderlies washed their hands, but immersed them for one minute in a solution of carbolic (1-20). He never had any reason to consider a change in this method, which was so warmly advocated by Lister.

By experiment we found that the unwashed hand always grew air-borne organisms and the *Staphylococcus albus*. I never succeeded in finding a streptococcus. We also found that washing, however thorough, always increased the number of organisms on the hand. As a result of these experiments it is suggested that the following method of treating the hands, while it may not be the best, is simple, consistently efficient, and does not damage a delicate skin. Unwashed socially clean hands should be rubbed together for one half minute in a 1-1000 solution of biniodide of mercury, and then rubbed together in commercial spirit for one half minute and allowed to dry. A sterile swab may be used to rub the hands with the spirit, and the hands may be dried with a sterile towel if preferred. The routine advocated is as follows.

1. Every student and midwife should be trained to keep the hands socially clean. The only way this can be done is to insist that the habit be formed of cutting or filing the nails down at a definite time on a definite day of the week.

2. Abstention is all-important. Every doctor, student, and midwife should carry a pair of well-fitting unpunctured rubber gloves in a suitable pouch. When required the gloves can be put on, using powder if necessary. The gloves when on should be washed and rubbed together in antiseptic as above described. Any number of cases can be examined or dressed, the same routine being carried out between each case. At the end of the morning the gloves should be washed, treated with antiseptic, dried on an ordinary towel, powdered, and returned to the pouch. The outside of the glove becomes the inside on the next occasion, and is found to be sterile.

3. If there is any possibility of the gloves being punctured during the operation the hands should be treated as above suggested before the gloves are put on. After the hands have been treated, and the gloves have been put on and sterilised, the gown is put on. The gloves are pulled up over the end of the sleeves and re-rinsed in biniodide. Between operations the gown can be changed and the gloves re-sterilised. Punctures with a fine needle do not matter, but if any obvious puncture is made the glove should be changed. Before making vaginal examinations, removing placentæ, &c., it is quite unnecessary to treat socially clean hands before putting on the gloves.

This technique, it is contended, will cut down the expense of gloves to the hospital, will save a lot of trouble to the nursing staff, and inculcate logical ideas in the minds of future practitioners. It will be of still greater importance in the practice of midwifery in private. When one is called to a dirty house to clear out an abortion or to put on the forceps single-handed, it is impossible to carry out the theatre ideas of asepsis. It is often impossible to get frequent changes of water in which to wash. Very often the patient has to be moved in the middle of the operation or the anæsthetic has to be seen to. It is partly because a blind and pathetic faith in the inherent asepsis of a once boiled glove is so strongly entrenched in the mind of the present-day student that the results in midwifery are so lamentable.

The above technique is logically sound, is bacteriologically confirmed, and has been thoroughly tested by me in the obstetrical and gynæcological practice of the Rotunda Hospital. Let us avoid the danger of being lost in admiration of a ritual which appears attractive merely because of its inherent difficulties.

Part II.—(J. W. B.).

The technique used for the bacteriological control of the various methods of hand preparation was to wash with 10 c.cm. of sterile saline, using a sterile swab with which the hand was well scrubbed; 1 c.cm. of this saline was added to a tube of melted agar at 48° C. and a plate poured. After 48 hours' incubation the number of colonies was counted. The method of sterilising the glove on the hand was tested, firstly, on an ordinary non-sterile glove; secondly, on a glove contaminated with pus and fæces; and, thirdly, on a glove on which a culture of *B. coli* had dried. In all cases the glove was sterile when examined after treatment on the hand. Since the method was obviously efficient for the sterilisation of the exterior of the glove it remained to examine the condition of the hand within the glove, an important matter owing to the possibility of bacteria escaping from the hand through a puncture in the glove.

First, a number of socially clean hands were tested and from them bacteria varying from 80 to 6320 were removed by the washing process. Then similar hands, which had been enclosed in sterile gloves for periods of from one to two hours, were examined and the bacteria were found to number from 1380 to 25,000. As regards the preparation of the hands, it was found that thorough washing, as practised in operating theatres, increased the bacteria easily removable, in one case from 1300 to 35,000 and in another from 5080 to 18,400. Subsequent treatment with 1 : 1000 biniodide eliminated the majority of these. The commonly used method of inserting the washed hand into a glove containing 1 : 1000 biniodide was found to give very varying results, from 0 to 14,700 bacteria having been found on hands so treated. The substitution of sterile water for biniodide was even less successful, and "wet" methods were decided to be unreliable from the bacteriological point of view, in addition to being injurious to the skin. It was found that spirit alone, without previous washing, the hand being allowed to dry before a sterile glove was put on, gave very good results. In one case a hand so treated after two hours only yielded 20 bacteria, while the other hand, entirely untreated, gave 3310.

Dr. Theobald's technique was tested 19 times, the gloves remaining on the hands from one and a half to five hours. On three occasions the hands were sterile. Twelve times the bacteria were 100 or less. Only in two tests did they exceed 350. A really bad result was only obtained once, 3220 bacteria, and here it is believed that some gross error had been made either in the technique or in the testing. In the case of a dry hand very few bacteria could escape through a small puncture in the glove, and if infected material is avoided by the bare hand the chance of these being pathogenic is remote. The bacteriological tests have supported Dr. Theobald's contention that his method is a safe one for surgical and obstetrical practice.

Brighton, Hove, and Preston Dispensary.—The financial position of the institution had for years been causing considerable anxiety to the governors, and the year 1922 closed with a serious deficiency; great efforts were made and the year 1923 closed with a balance in hand of £62. At the annual meeting of the governors on Feb. 12th Alderman and Mrs. W. Jago were appointed life-governors in recognition of their valuable services in raising money for the institution. The governors accepted with regret the resignation of Colonel C. Somers Clarke, for many years hon. secretary. The annual report showed that 3879 out-patients were treated—820 at the parent establishment, 838 at the northern branch, and 2221 at the western branch—while the total number of patients visited at their homes was 1403, the number of visits paid being 9929.

BED-ISOLATION,

WITH SPECIAL REFERENCE TO MEASLES AND CHICKEN-POX.

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RECENT reports of the experiences of different observers [1 2 3] who have instituted the system of barrier-nursing, known as "bed-isolation," have rendered any fresh description upon my part of the technique of the method unnecessary. I have myself given brief accounts elsewhere [4 5] of the working and results of the system at Little Bromwich Hospital. In this paper I propose to give some instances of success and failure in the bed-isolation of cases of measles and chicken-pox.

The technique of bed-isolation, which I personally learned from Dr. C. Rundle, of Fazakerley, some 12 or 13 years ago, has—probably with some modification—been carried out by various workers. It is possible, of course, absolutely to standardise technique, but it is obviously not possible to standardise the all-important human element which necessarily has to carry out the technique laid down. Nevertheless, it may be assumed—and this is certainly true of my own hospital—that at every institution at which the method has been given a trial the best available nursing staff, under a good surgically trained sister, has been employed to work the ward. It goes without saying that if we have in bed-isolation a method which can entirely replace not only the orthodox isolation block of small separate wards but the cubicle block for all the purposes to which such blocks are put in infectious diseases hospitals, then we possess a method which, particularly in these days of high building costs, is one of enormous utility and economy.

The value of bed-isolation in every-day fever hospital practice must, I submit, be judged rather by its failures—where failures have occurred—than by any aggregate of successes. It is easily possible, as a glance at my registers would show, to state with perfect truth that a large number of cases had been nursed in bed-isolation without any instance of cross-infection having occurred. This may convey very little. It is well known to all of us that certain of the acute infective diseases may be perfectly safely nursed in the same ward as patients suffering from other infections, or from no infection at all, provided the principles of barrier-nursing are carried out. But there are other of the acute infections about which we are not so sure.

Measles and Chicken-pox as Tests.

Dr. Frederic Thomson considers that measles and particularly chicken-pox constitute a fair if critical test of the system. I agree with him, if only for the reason that, in this country at any rate, these are the two diseases which so frequently give rise to administrative difficulties not only in fever hospitals but in hospitals for sick children and other children's institutions. If these two diseases are admitted to be fair criteria, then the questions to be decided are the following:—

1. Can bed-isolation completely replace for the segregation of measles and chicken-pox, admitted in any stage and in any number, the ordinary isolation block of small separate wards or the cubicle block?
2. If it cannot wholly replace these other systems in the case of these two diseases, to what extent, if any, can it replace them?
3. If it cannot replace them wholly or in part, what are the probable reasons for failure?

[1] Rundle, C.: THE LANCET, 1922, ii., 376.
[2] MacIntyre, D.: Ibid., 1922, ii., 377.
[3] Thomson, F.: Ibid., 1923, i., 1146.
[4] Harries, E. H. R.: Ibid., 1922, ii., 538.
[5] Reports M.O.H., City of Birmingham, 1920, 1921, and 1922.

The System in Being at Little Bromwich Hospital.

The bed-isolation system at Little Bromwich Hospital has now been working for three and a half years. During this time in round numbers 1200 cases have been admitted to the wards in which the system is employed. The first 800 cases or so were nursed in a ward in which a wall space of only 9 ft. per bed was allotted; for the succeeding 400 a better ward has been in use in which a wall space of 12 ft. per bed is allowed.

The original ward contained in each division—the divisions being separated by a central kitchen and lobby—eight beds and eight cots—i.e., a total of 32. The present ward contains six beds and six cots in each division, and also possesses two side-wards opening off each of the main divisions. (These side-wards usually receive members of the nursing staff who may be suffering from diphtheria or scarlet fever.) In the original and in the present ward one, and sometimes two, iron cradles have been frequently employed in addition, for the reception of infants up to a year old. These cradles, when in use, are invariably placed in the middle line of the ward, near the central fires, and never along the walls.

In both the wards employed beds have always occupied one side of each division and cots the other. This is a factor of some practical importance in estimating results, since it is obvious that the test of the system must be more severe in the case of the very young susceptible children occupying the cots than in the case of the older children and adults occupying the beds. This arrangement, although not necessarily eliminating the human immune barrier, certainly alters the probable distribution of these barriers in the ward.

Before proceeding to an examination of results it is, I think, necessary to state the reason for introducing "bed-isolation" at Little Bromwich Hospital, since the reason for the introduction of the system may have a very important bearing upon the extent and variety of the infective material admitted to the ward.

Incidence of Cross-infection.

The original ward at Little Bromwich arose not out of any desire to test the limits of the system, but out of the sheer necessity for providing at a time of epidemic diphtheria, scarlet fever, and measles additional accommodation for cases which for one reason or another it was impossible or undesirable to admit either to the ordinary scarlet fever or diphtheria wards or to the orthodox isolation blocks, which were full. Hence, every case admitted to the ward was accompanied by the pious hope that no cross-infection would occur.

In the course of nursing 1200 cases cross-infection has been initiated by measles on three occasions, by chicken-pox on three occasions, and by scarlet fever twice. Six of these eight breakdowns—viz., measles twice, chicken-pox three times, and scarlet fever once, occurred in the original ward (with a wall space of 9 ft. per bed). When measles "crossed" on two of the three occasions the child in the adjoining cot only was infected (once with a wall space of 9 ft. and once with 12 ft.); on the third occasion three children on the opposite side of the ward were infected. (This outbreak will be discussed later.) In the case of chicken-pox on two of the three occasions of breakdown an extensive ward infection followed; on the third occasion the child in the next cot only was infected.

The bald statement given above possesses little scientific value. In order that some opinion may be formed, it is necessary to know not only how many times measles, chicken-pox, and scarlet fever have been introduced into the ward, but in what stages they were introduced, and also to have an idea of the number of other patients "at risk" on specific occasions. With regard to scarlet fever, beyond stating that this disease has in various stages and with various accompanying conditions been nursed in bed-isolation on hundreds of occasions, and that in both instances cross-infection was due to proved personal contact (in breach of rules) of a child in an infective

condition with another, I do not propose further to consider that disease in this paper. It is well recognised that the infectivity of scarlet fever is low and that it can be barrier-nursed with very slight risk of spread.

Measles.

I have analysed the first thousand cases admitted to the ward and I find that in that total were comprised 63 cases of measles. It is generally agreed that the infectivity of measles has become very considerably lessened by the time that the exanthem is fully out; hence, it is important further to classify these 63 cases according to the state of disease on admission. The admissions were distributed as follows:—

1. Pre-exanthem stage—i.e., either incubating or Koplik's spots only present on admission	23
2. Exanthem appearing or fully out on admission ..	30
3. Exanthem faded on admission	10

Thus, of the 63 admissions about a third inhabited the ward during their most infective phase. In each of the three instances of cross-infection by measles the originating case belonged to the first or pre-exanthem group.

Chicken-pox.

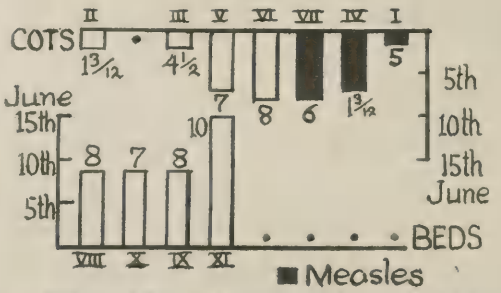
A similar analysis of the first thousand cases dealt with under conditions of bed-isolation shows that chicken-pox was admitted on 24 occasions. These 24 cases may be divided as follows:—

1. Incubating	4
2. Early eruption	10
3. Scabbing	10

The three breakdowns after the introduction of chicken-pox were each attributable to cases admitted during the incubation period.

I must confess, having regard to the failure of so experienced a physician as Dr. Foord Caiger always to prevent the spread of chicken-pox in glass cubicles,[6] that I introduced chicken-pox into my bed-isolation ward with great trepidation. After a few successes with cases introduced in the later stages of the eruption I ventured on a case in the incubation stage and failed. As I have already mentioned, three out of four cases introduced at a similar stage

FIG. 1.



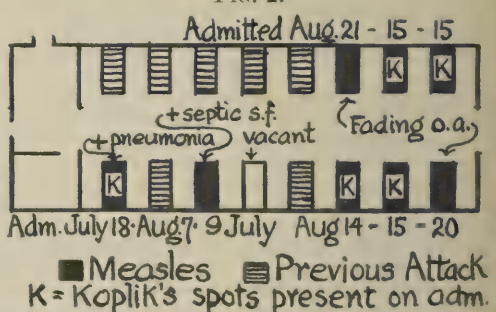
Measles: Order and date of admission and ages of first population of west division of ward. I., early measles; IV., measles with broncho-pneumonia; VII., early measles. No history of previous measles in other patients.

have led to subsequent cases. Whatever the cause—air-borne or human-borne infection—our experiences with early chicken-pox have been so unfortunate that I would not knowingly admit a case of this disease, at any rate in the incubation stage, to the bed-isolation ward, and I prefer not to admit it at any stage. Hence, the small total of admissions of this disease.

I must here refer to certain reconstructions of actual bed-isolation ward populations with particular reference to measles. All the diagrams which I have made are constructed from material furnished by the original ward—the wall space per bed being, as I have stated, 9 ft. From the point of view of air-borne infection this lessened wall space involves a more severe trial of the system than where a greater wall space obtains; and further, under these conditions the strain upon the nursing staff is greater, owing to the larger number of patients to be bed-isolated. Hence the first 800 cases dealt with at Little Bromwich constituted a rigorous test of the possibilities of aerial spread from bed to bed and of the quality of the nursing. In fact, these two conditions—limitation of wall space and strain on the nursing staff—may be considered as having borne too hardly upon the system. Are there any factors other than space and technique which may operate in favour of safe bed-isolation?

I have already indicated that in my opinion it is important to stress the stage of the disease under discussion at the time of its admission to the ward. Our failures with measles and chicken-pox occurred in connexion with cases admitted in the earliest stages. Again, I have myself stated that "as many as three cases of measles in the early pre-eruptive (Koplik's spots) stage have been safely treated at one time in a single division of the ward."[7] This is

FIG. 2.



Measles: Ward containing eight cases in various stages. Every other inhabitant of the ward had a previous history of measles. If the histories were correct there was no likelihood of cross-infection; in any case none occurred either in this (west) or in the east division of the ward.

perfectly true, but such a statement may not under all conditions have an equal epidemiological value.

For example, I have reconstructed (Fig. 1) the first population of the original ward which was opened on June 1st, 1920. On that day the first case—one of measles in the early stage (Koplik's spots present—rash just appearing) was admitted to Cot 16. The second case (Cot 9) came in the following day, and so on. The order and day of arrival of each case are indicated upon the diagram—the latter (day of arrival) by the length of the column. Only the cases admitted up to June 15th are shown. By that date Cot 10, and Beds 1, 2, 3, and 4 had not been filled and were not occupied until several days later.

From the point of view of risk of infection from measles, therefore, it will be seen that of the small community of 12 persons admitted in a period of 15 days, three came in with measles (two in the early exanthem stage) and one with exanthem fully developed. According to the histories obtained, none of the remaining nine patients had had measles. Histories of previous attacks of measles are, of course, not very reliable—the chances are that some of these nine patients had had measles. But even supposing they had not, what were the real risks of infection, air-borne or human borne? It will be seen by a study of the diagram that the greatest source of infection was probably introduced into Cot 14 on June 8th (early measles); risk of infection from Cot 15 (late measles) was negligible. No. 16—the first case admitted—would, in its phase of maximum infectivity, only be capable of infecting the inhabitants of Cots 11 and 9, who were admitted to the far end of the same side of the ward on the following day. Risk commenced at Cot 14. No. 5 arrived on the fifteenth day when all danger had passed. So that the risk of spread was really confined to seven inhabitants. No cross-infection occurred. Thus, although it is true to say that three cases of measles

[6] Reports M.A.B., 1907, 1908, quoted by Chapin, Sources and Modes of Infection, 1910.

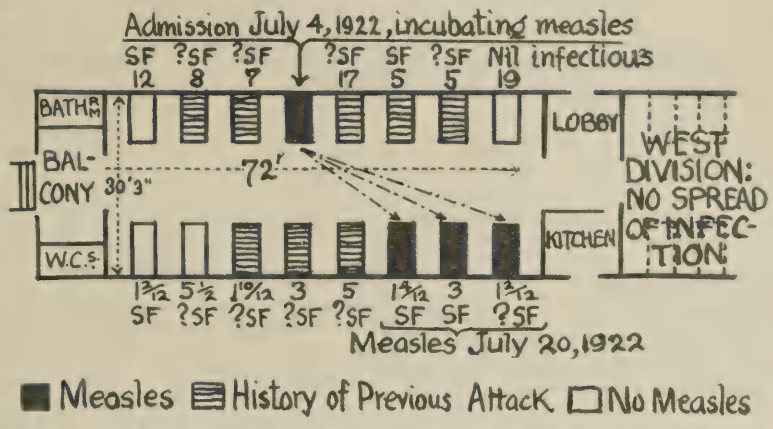
[7] THE LANCET, loc. cit.

two of them early) were nursed at one time in the ard, yet the real risk of spread at any one time is ery much smaller than this bare statement would eem to imply.

Fig. 2 shows what protection against measles crossing" may be afforded by reason of previous ttack. In this particular ward population there are ight cases of measles, five of them ıtroduced in the stage of Koplik's pots. The cases were admitted in he ordinary routine work of the ard—i.e., the remaining population as in no way selected or arranged. here is one vacant cot. Every one f the remaining seven patients ad a history of previous measles. herefore, if this history was correct, here was no likelihood of cross-ıfection. In any case none ccurred either in this (west) or the ast division of the ward. Protec-on as a result of previous attack ıay therefore be a powerful ally ı bed-isolation work.

Fig. 3 is a reconstruction of a ard population amongst which ɔread of measles occurred following ıe introduction of a case in the age of incubation. Three young ıildren on the opposite side of the ard developed measles on the same ate. Was infection air-borne or uman-borne?

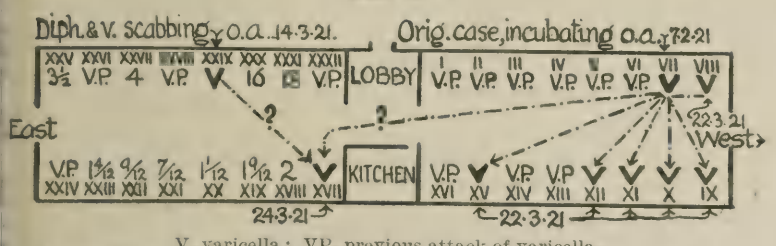
FIG. 3.



Measles: Diagram showing cross-infection originated by a case admitted incubating measles. Fifty per cent. of ward population protected by previous attack.

It will be noted that the line of spread was entirely ı one direction—that is, obliquely across the ward—nd that as much as 50 per cent. of the ward popula-on at the moment were protected by previous ttack. In favour of the air-borne theory it is of ıterest to note that at the east end of the ward is door opening on to a balcony and that this door ɔ that time of the year (July) would be almost ɔnstantly open; that the east end of the ward is ɛposed to what is practically open country, and that ı many occasions a breeze would be blowing through ıe ward from east to west. It is perhaps of some gnificance that the three cases infected were to the est of the infecting case. Is it not, however, much ore likely that these three children were infected

FIG. 4.



V, varicella; VP, previous attack of varicella.

Chicken-pox: Diagram showing distribution of cross-infection following a concealed case admitted in incubation period (see text). Every patient in the same division unprotected by a previous attack developed chicken-pox, except a three weeks old baby in a cradle. How was No. XVII. in the east division infected? By aerial spread, by a nurse, or from No. XXIX.—a very late case?

showed scars of chicken-pox. The tenth—a boy admitted with scarlet fever and lesions of scabies which had become impetiginous—was found on careful search to present three or four quite recent and typical scars of chicken-pox on the chest amongst his healing impetiginous lesions. I have no doubt that this boy, admitted in what must have been the commencement of his incubation period, was the source of infection for the others. Note that a three weeks old baby in a cradle escaped. Two days later a case of severe diphtheria with cardiac trouble in the opposite division of the ward developed chicken-pox. How was she infected? On examination of the other patients in this division it was found that No. 29 had been admitted with diphtheria and a few chicken-pox *scabs* ten days before No. 17 developed chicken-pox, No. 29 having herself developed chicken-pox some six weeks before admission to the ward. She was therefore a possible but unlikely source of infection.

The other possibilities are two—either that there was an air-borne infection from the far corner of one division of the ward through the lobby and round the corner to Cot 17 in the opposite division of the ward, or that infection was conveyed by a nurse from the infecting case not only to the six susceptible children in the west division of the ward—who simultaneously developed varicella—but to the very ill child needing constant attention in the corner of the east division. When I say that a night nurse on duty at relevant dates was found to have had an unreported bandaged finger impossible of proper sterilisation, I think there are some grounds for accepting the view that the diphtheria child in the other division at any rate was the victim of human-borne infection. The escape of the three weeks old baby is interesting from the point of view of immunity, since this child would need frequent attention, and was also—if the air-borne view be preferred—in the direct line of spread from one ward to the other.

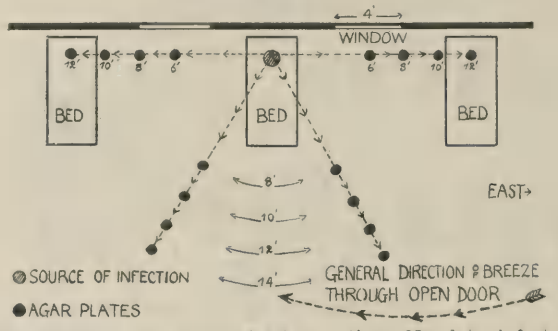
The other extensive outbreak of varicella originated with a child admitted as a "contact" and who duly

nultaneously as the result of a breach of technique ı the part of doctor or nurse examining or attending e introduced case and then proceeding without ficient sterilisation of hands to attend to these three ung children? My own belief is, that this is an stance of human-borne infection. It is understood, course, that the incubating child did not leave its d and stroll across to its neighbours.

Turning now to chicken-pox, I have reconstructed ıe of the three failures which is of some interest. g. 4 illustrates an outbreak following the admission what I have called a "concealed" case of chicken-ɔx and incidentally emphasises the ease with which icken-pox may be missed, and the difficulty of

developed the disease. The child in the next bed developed chicken-pox 17 days later. Eighteen days later a child in the opposite division of the ward developed chicken-pox, and from this case arose four further cases in the same division after 15, 16, 16, and 19 days respectively. In this instance it is impossible to exclude the possibility of air-borne infection in the first "cross"—i.e., to the child in the next cot, but it is also impossible, I submit, to exclude the view that infection was human-borne from the one division of the ward to the other. Air-borne infection may have accounted for the four cases of the third generation which arose in this division, the spread being in the direction of the breeze through the open door and to both cot and bed sides. In any case, the experience was sufficiently unfortunate, and resulted in the ward being put out of action for a considerable period.

FIG. 5.



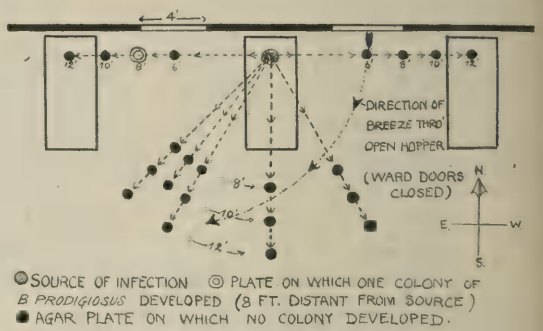
Experiment 1.—Result completely negative. No plates infected with *B. prodigiosus*.

Experiments with B. prodigiosus.

In conjunction with my colleague, Dr. Hubert Henry, City Bacteriologist for Birmingham, an endeavour was made to ascertain how far an organism could be projected by coughing. Advantage was taken of the fact of the old bed-isolation ward being empty after cleaning and a section of the east division was arranged as regards spacing of beds exactly as when the ward was in use for bed-isolation. The organism proposed to be employed was that well-tried favourite of similar experiments—*B. prodigiosus*.

On the day preceding the first experiment a number of agar plates were exposed in various parts of the floor of the ward and left for 25–30 minutes. These on incubation showed no evidence of the presence of *B. prodigiosus* in the ward. Accordingly, on the following day a series of plates was arranged as in Fig. 5. I then heavily infected my own throat with a broth culture of *B. prodigiosus* and arranged myself on the central one of the three beds exactly in the position of a patient. Dr. Henry then uncovered the plates, and I coughed vigorously and repeatedly—partially raising myself on the bed to do so—first to right and left of the bed and then obliquely forward over the bed to right and left in the line of the plates. The plates were left undisturbed for 25 minutes and were then covered and collected by Dr. Henry, who, after incubating them in his laboratory, reported that not a single colony of *B. prodigiosus* had developed on any of the plates. It will be noted in the diagram that a breeze (it was a July day) was blowing through the open door. The general direction of this breeze is denoted by the arrow. On the whole it tended to blow *against* the direction of my coughs.

FIG. 6.



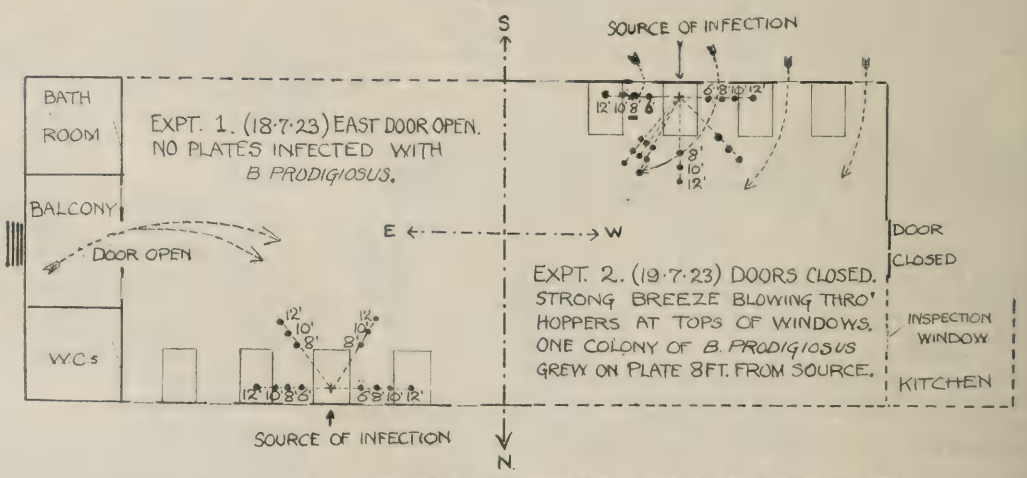
Experiment 2.—With *B. prodigiosus*.

On the following day the opposite side of the same division of the ward was used, three different beds being set up. In this experiment the ward doors were closed, but a breeze was blowing through open hopper windows behind and above the beds. The general direction of the breeze is again shown by an arrow. An additional number of plates was employed in this experiment (as shown in the diagram). I again infected my throat and again endeavoured to cough vigorously in the lines of the plates. The plates were again allowed to remain 25 minutes, and then dealt with by Dr. Henry as before. Dr. Henry reported that a single colony of *B. prodigiosus* had developed on the plate which had been placed 8 feet due east of my head. It will be noted that the direction of the breeze in this instance was towards the east end of the ward.

(Fig. 7 is a combination of Figs. 5 and 6 in order better to show the relative positions in the ward at which the experiments were made.)

These two experiments, of course, are no more than suggestive, and I do not for a moment attempt to draw any deduction from them. All they do show is that an adult artificially infected with a known organism

FIG. 7.



Combined diagram of experiments on successive days in empty east division of ward.

nd simulating the act of coughing in certain directions vas—with a breeze assisting to an unknown extent—ble to infect an agar plate 8 feet away—and no urther—in a direct line with his head. Many more xperiments under more varied conditions are desirble. It does not follow that because *B. prodigiosus* ould only be propelled 8 feet that the virus of measles r of varicella cannot be spread further by a patient ctually suffering from one disease or the other.

In this connexion attention may be drawn to a very aluable contribution by Wynter Blyth to the Section f Public Health at the British Medical Association nnual Meeting, 1923.[8] This author criticises much f the experimental work which has been done in onnexion with the bacteriology of sewer air and mphasises the conditions which obtain where rganisms are carried in bubbles. He says:

> The thinnest bubble . . . could carry an organism with diameter some 17,000 times greater than the thickness of he film. When a bubble breaks there is no 'explosion' ut the film, as it were, 'flaps back' at the rate of 72 miles n hour, and it is this force which ejects the comparatively normous organism. Absorption of liquid by the organism s one of the factors in determining its convection by light urrents of air, and such absorption is minimised if the rganism has been in contact with grease. It was found by xperiments with *B. prodigiosus* that the maximum time aken to fall through 100 cm. when discharged from a ubble of soap was one minute, and when discharged from bubble of gelatin 45 seconds.
>
> ". . . The volume of the globule of water and organisms to hat of the naked organism is . . . about 1000 to 1. Neverheless, these particles are small enough to be carried conderable distances by low velocity currents of air as much s 6 feet in a draught of only 30 feet per minute."

The possibility of bubble infection under conditions f bed isolation deserves further investigation. With egard to the extreme infectivity of chicken-pox at its arliest stages, the work of Girard [9] on complement leviation in chicken-pox is interesting. Girard found hat the reaction appears in the early days of the lisease—from the first to the sixth; by that time it s only feebly positive. Girard used as an antigen a saline extract of varicella scabs. It does not follow, f course, that the antigen is necessarily the virus.

Summary and Conclusions.

May I now, if only to serve as points for discussion, ummarise the conclusions I have arrived at:—

1. Bed-isolation cannot replace small separate vards for the nursing of measles and chicken-pox n their earliest phases. These diseases in their later nd less infective phases may be safely nursed under onditions of bed-isolation.

2. For short distances it is impossible to exclude the heory of aerial spread—possibly by bubbles in the ase of measles. For distances of many feet human-orne infection is much more probable. Cases of neasles and of chicken-pox in their later phases can e successfully nursed with a wall space of 9 ft. er bed. A wall space of 12 ft. has not entirely revented cross-infection by measles admitted in the arly stage. Nevertheless, a wall space of not less han 12 ft. per bed should be available. This ensures a maller number of patients in the ward, and hence ess probability of the staff becoming overworked and lurring the technique.

3. Protection by previous attack plays a part which lways is important but which varies with different liseases, and with the age distribution of the ward opulation. In the case of measles as much as 50 per cent. of the ward population at any time may e protected by previous attack.

4. In spite of its limitations in the direction of arly measles and chicken-pox, bed isolation is a valuable method for the treatment of conditions of elatively low infectivity and of non-infective conditions in the same ward. It is a method which lepends for its success almost entirely upon the skill nd integrity of the nursing staff.

[8] Brit. Med. Jour., 1923, ii., 762.
[9] Girard: Thèse de Paris, 1918.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PATHOLOGY.

A MEETING of this section was held on Feb. 19th, Dr. J. A. MURRAY being in the chair.

"Aleukia."

Dr. S. C. DYKE recorded observations on six cases of this condition, all characterised by a leucopenia of varying degree, with a relative and actual diminution of the polymorphs; in all the platelets were greatly increased in numbers. Clinically all the cases showed a hæmorrhagic tendency, and some had been labelled with the diagnosis of purpura hæmorrhagica. Sections of the spleen and bone marrow were shown from three of the cases; these showed in one instance a streptococcal, in the second a tuberculous infection, and in the last the presence of coliform bacilli. Dr. Dyke discussed the question as to whether the infection was to be regarded as the cause of the anæmia and hæmorrhagic manifestations, or whether the infection had merely gained a foothold as a result of the aplastic state of the hæmatopoietic system. The conclusion was that the myelophthisic state was primary and the infection secondary.

Experimental Biliary Cirrhosis Due to Manganese.

Dr. G. MARSHALL FINDLAY said that although cases of chronic manganese poisoning had been described among industrial workers on the Continent, in America, and also, more recently, in this country, comparatively little was yet known in regard to the pathological changes produced by manganese. This lack of knowledge might be due to the fact that the post-mortem examination of only one case of chronic manganese poisoning in man has so far been recorded (Casamajor, 1916), while attempts to produce manganese poisoning in animals had not been very satisfactory. Experiments were therefore carried out on rabbits, guinea-pigs, and rats. When manganous chloride was injected subcutaneously into rabbits in doses of from 20–80 mg., the animal usually died in from one to two days. Microscopically, there was found very marked fatty degeneration of the liver parenchyma, while in the kidneys there were hæmorrhages into the glomerular capsules and degeneration in the tubular epithelium. When smaller doses of from 3–5 mg. were injected subcutaneously for from six to eight weeks, the rabbits usually showed a decline in body-weight and in some cases a rigidity of the hind limbs and neck. On post-mortem examination there was frequently an icteric tint in the subcutaneous tissues, but no evidence of ascites. The liver was usually enlarged, the surface being either smooth or slightly roughened and the colour yellow or yellowish red. Microscopically in the liver there was found an increase in fibrous tissue accompanied by a small round-cell infiltration and the formation of fresh bile capillaries. These changes were at first restricted to the portal spaces, later they extended round the periphery of the lobules, giving rise to a form of cirrhosis definitely monolobular in type. Subcutaneous injections of manganous chloride in guinea-pigs were followed by results entirely similar to those described in rabbits, the liver showing the various stages of biliary cirrhosis. Rats, when repeatedly injected with manganous chloride, also developed a cirrhotic condition in the liver, accompanied by jaundice but unassociated with ascites. In some cases they exhibited a rigidity of the legs and neck. The fibrosis in the liver was at first confined to the portal spaces and to the periphery of the lobules, but later it extended between the parenchymal cells, dividing them up into little islands. Many of the liver cells were hypertrophic and all showed fatty changes. A number of rats also were fed on manganous chloride which was added to their ordinary diet. In from six to ten weeks they likewise developed

a cirrhosis of the liver associated with jaundice and in some cases with rigidity of the limbs. The microscopical appearances in the liver were similar to those produced by the subcutaneous administration of manganese. It was of some interest to note that many medicinal waters contained small though quite appreciable quantities of manganese salts in solution. The selective action of manganese on the liver would appear to be due to the fact that it was largely excreted from the body by the bile. It was only when large doses were administered parenterally that small amounts might appear in the urine. The similarity of chronic manganese poisoning to the syndrome of progessive hepatico-lenticular degeneration described by Kinnier Wilson (1912) was extremely striking. The nervous lesions occurring in the animals used in these experiments were at present the subject of investigation.

A communication on Growth-promoting Substances and Embryonic and Tumour Extracts, by Mr. A. H. DREW, was also read.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

A MEETING of this Society was held at the rooms of the Medical Society of London on Feb. 29th, Colonel L. W. HARRISON, the President, being in the chair.

A Suggested Investigation.

The PRESIDENT intimated that the Council had given consideration to a statement [1] made at a recent discussion to the effect that the modern intensive treatment of syphilis was responsible for an increase in neuro-recurrences in syphilitics. There were divergent views on the matter, not only here, but on the Continent, and it was very desirable to settle it. Therefore the Council desired that members should investigate the point, each in his own clinic. During the war about 100,000 soldiers had had a necessarily short course of salvarsan and mercury treatment, and as the war started nine years ago, the time was approaching when the aftermath of syphilis of the parenchyma of the central nervous system among those cases could be expected. On the basis of a 4 per cent. incidence of general paralysis of the insane and 2 per cent. of tabes, then some 6000 of those war cases could be expected to present themselves with syphilis of the parenchyma of the central nervous system. He believed there was nothing like that number in the whole country, and in the treatment centres none, or very few, had been seen. He hoped this combined inquiry would settle this important question once and for all.

Dr. F. N. KAY MENZIES supported the President and advocated the issuing of a questionnaire to all in charge of venereal clinics.

Dr. WILFRID FOX said a similar statement was made after each advance in the treatment of syphilis had been introduced. Some thought neuro-recurrence would ensue if anything more than Hutchinson's pills were given.

A discussion was then held on

The Instruction of the Medical Profession and of the Lay Public with Respect to the Facilities Provided for the Diagnosis and Treatment of Venereal Disease.

Dr. MENZIES, in opening, pointed out that by Article IV. of the Public Health V.D. Regulations, 1916, county councils and county borough councils must arrange lectures and addresses of an instructional character, as well as for the publication of any information which was likely to be of value, either to the medical profession or to the lay public with regard to venereal diseases. Those in the London County Council took the view that it was best that some things should be done by the public authority itself, while others could well be delegated to voluntary bodies, which should be paid for the duties they carried out in furtherance of the scheme. The whole profession in London was circularised, giving particulars of the schemes for treatment and the facilities which had been set up, where material could be reliably examined, and a report furnished; also how the members of the profession could be merged into and be helpful to the whole crusade. Certified practising midwives were also supplied with the necessary information on the subject; these could be very useful in bringing cases suffering from syphilis to the clinics. Other circulars were sent to maternity and child welfare centres, Poor-law authorities, and prison authorities, the last-named because of the number of prisoners who might still be in an infective condition when their sentences had expired. Magistrates, police, and bodies of social workers were also circularised. Next, a scheme was started for informing the public where treatment could be obtained, and Dr. Menzies showed specimens of posters which had been exhibited in public lavatories and other suitable places. He described the evolution which the Council passed through due to changing views as to what were the most efficacious means of reaching the public. In 1919 special series of addresses to employees of controlled firms were organised, and film representations setting out the dangers of the disease were frequently shown. Special committees were also started in the various metropolitan boroughs to assist the propaganda work. The L.C.C. had now dropped the press portion of the campaign. In London the pathological examinations made for practitioners in connexion with the disease numbered 3000 in 1917; in 1923 it had risen to 24,000. The teaching facilities to the profession had given, so far, a rather disappointing result. The all-day clinic had been found to be of enormous advantage. Four hundred London practitioners had now taken up the offer of salvarsan and substitute drugs free of charge, having produced the necessary certificate of competence to use them. Hints as to better or more likely lines of attack had been invited, but to this the critics had made a very poor response.

Mr. FRANK KIDD agreed that the propaganda which had been carried out by the L.C.C. was admirable, but as there had been some very unwise propaganda indulged in, he wished to utter a warning. It was, he thought, a mistake to use fear of disease as a weapon for inducing people to come for treatment, though probably it had been a factor in getting the V.D. clinics started, and without the clinics it would not have been possible to train doctors to use the new means of treatment. In the long run schemes of propaganda based upon fear were bound to fail; and a new malady seemed now to have arisen, which he might call propaganda disease. There were now an increasing number of patients with syphilophobia and gonorrhœophobia, who consulted the doctor with a fixed terror of venereal disease. They believed they would never be cured, that they would not be able to marry, and would die insane. They had read a number of alarmist statements in the papers, and believed them to be true. At a venereal section, of 630 attendances, 34 were women who applied because they suspected their husbands after reading propaganda advertisements, but none of the husbands were found to be diseased. Three others who were free of disease came because what they had read in their Sunday paper made them uneasy. Many—mostly men—applied for expert examination before marrying. In many with diseased minds on the subject it was found to be difficult, if not impossible, to cure them. Some of the patients had been in the hands of unwise and inefficiently trained men, and in them there was no evidence that there had been disease for a long time. Mr. Kidd quoted a number of cases illustrating these points. He urged that in this campaign an appeal should be made to the highest instincts, the building up of character and of good clean social habits. He would rather see 10 per cent. of the population suffering from venereal disease than 50 per cent. suffering from, weighed down by, the fear of it, and he held a similar view on the subject of the cancer campaign.

[1] See THE LANCET, Jan. 19th, 1924, p. 131.

Mr. E. B. TURNER dealt with the question from the standpoint of the general practitioner. He said he agreed largely with what Mr. Kidd said concerning propaganda on the wrong lines, but, as one who was responsible for a great deal of propaganda on this subject, he was convinced that propaganda on right lines did an enormous amount of good. There might be cases of syphilophobia, but the campaign had brought to many the realisation that they had the disease and how important it was that they should be promptly treated for it. The free clinic was a wonderful way of treating the disease and diminishing its incidence. But it became a different matter in rural and other sparsely populated districts. There clinics were few and far between, and the servant or farm-hand could not get leave from work to attend a distant clinic. When clinics were set up in the suburbs of large towns patients preferred to go into the town because they felt more secure from suspicion among their fellows. The only remedy seemed to be the education in these matters of the medical profession as a whole, and it was this need which made him urge a general recognition of the subject by the General Medical Council in the medical student's curriculum. Even though some medical men preferred not to treat venereal disease every practitioner should be able to take a smear and make a diagnosis and, if positive, direct the patient to the place where he could be efficiently treated. The aim should be to get cases at the beginning, and to that end the whole profession should be organised.

Prof. WINIFRED CULLIS said that, as a physiologist, she had always sought to emphasise the supreme importance of maintaining a high standard of health. She agreed with Mr. Kidd in deprecating the use of fear as a motive. Remedial measures were good, but how much better to be able to abolish the need for those measures. Unless the general populace could be educated as to the need to go to the clinics, the latter would do no good. With regard to syphilophobia, a certain proportion of people suffered from mental instability, but that was not a good reason for abolishing propaganda, which admittedly brought many people to the treatment centres. If physiology were more generally taught she thought there would be a much more sane and helpful attitude in regard to sex matters; there was still appalling prejudice on the subject, even among those who considered themselves educated, including the clergy. Help was required for the necessary teaching among the younger people. Positive knowledge was one of the best preventives.

Mrs. NEVILLE ROLFE, representing the National Council for Combating Venereal Diseases, said this body wished to push this campaign further than the public purse would support at present. During the last two years the National Council had been able to carry through a large amount of propaganda work against these diseases. She did not think the success of the campaign should be judged by its effect upon people who were abnormal, though she agreed with Mr. Kidd and others that the ground-work of the efforts should not be the instilling of the fear of the consequences of disease. Knowledge of the consequences, however, should not be withheld, nor should the bad results of neglecting to continue treatment. After a propaganda film was shown in a district the immediate attendances at the local clinic were often doubled. The Council had first to bring venereal disease up to the level of other public health subjects in the national consciousness, and she believed the right line now was to take all health subjects together and no longer concentrate on these particular diseases. Efforts should be made to reduce the agencies which promoted promiscuity. In four years the various notices had resulted in 87,600 letters being addressed to the National Council, a large number of the writers of which believed themselves to be infected and asked where they could obtain treatment. Mrs. Rolfe proceeded to speak in detail of the activities of the Council and the steps taken in the interests of men in the Mercantile Marine.

Colonel E. T. BURKE thought that such cases as Mr. Kidd spoke of were exceptional. Certainly the teaching of the general practitioner in these matters was essential, and it should be made a compulsory subject in the medical student's curriculum. Students should be required to have three or six months in the work of a V.D. clinic, so that a regiment of men would be built up who would be familiar with the matter on entering general practice. Colonel Burke spoke of the harmful effect of the statement of some doctors to their patients that three or four injections of "606" would put them right.

The PRESIDENT said he was sure Mr. Kidd would agree that propaganda was good so long as it was wise. He had long felt that all that was required was a plain statement of the case, without exaggeration, with emphasis on the value of thorough treatment, and its effect in preventing horrible late sequelæ. He thought the posters in the public lavatories were in the wrong place. In 1919 an offer was made by the Insurance Committee of London to give post-graduate instruction at Rochester Row, and in two years 400 practitioners attended that course. At St. Thomas's Hospital it was made compulsory for all dressers to attend the instruction on venereal disease in the centre. If that were followed at all hospitals it would do much to anticipate the benefit which would later accrue from the steps taken by the General Medical Council.

Dr. MENZIES briefly replied.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

A MEETING of the Fever Hospitals Medical Service Group of this Society was held on Feb. 22nd, Dr. E. W. GOODALL, the President, being in the chair.

Dr. E. H. R. HARRIES opened a discussion on

Bed-Isolation, with Special Reference to Measles and Chicken-pox.

His paper appears in the original columns of the present issue of THE LANCET.

The PRESIDENT congratulated Dr. Harries on his observations, but thought that little, if any, knowledge on the subject had been added to what was brought forward at the discussion held at a meeting of the Group in May last. In addition to the factors mentioned as being favourable to the spread of infection, such as the period of the disease, he would add the period of the epidemic. There was some evidence to show that certain diseases were more infectious during the waxing than during the waning of an epidemic. From his experience at the Eastern and North-Western Hospitals he had come to the conclusion that neither measles nor chicken-pox in the acute stage could be nursed, with safety to other patients, in a "bed-isolation" ward. In his experience cross-infection was more frequent in such a ward than in a ward or block consisting of completely separate rooms or chambers. That went to show that the conveyance of infection by air could not be ruled out. "Bed-isolation" wards should not contain more than 16 patients at the outside. The smaller the number of beds the better the result. It was desirable to provide the nursing staff employed in the ward with a written set of rules, but those rules should be simple and comprehensive. Local sanitary authorities must not be led into thinking that all kinds of acute infectious diseases could be treated together in the same ward under "bed-isolation" regulations, because even if it were found that the infection was never air-borne, it was quite certain that to prevent it being carried by any member of the staff that staff must be highly trained in these methods, and it was unlikely that the staff employed in small isolation hospitals would possess the requisite experience and technical knowledge. He thought it would be very difficult to defend an action-at-law brought in the case of a patient who had contracted a serious disease, such as measles, from another such case intentionally admitted into a "bed-isolation" ward.

Dr. FREDERIC THOMSON was glad that Dr. Harries assumed that at hospitals where "bed isolation" had been carried out the best available staff were employed for the work; evidence from the various hospitals concerned did not suggest much difference in efficiency of the staff, and any such implication would be invidious. Taking into consideration the size of these hospitals the choice of nurse must be ample, and it was more than probable that the nursing had been very good indeed. On the other hand, he could quite conceive that the requisite class of nurse might not be available in many small hospitals. He thought few could deny a measure of success to bed isolation as a mode of obviating the spread of infection by contact. Given a reliable staff, it was safe to treat mild or severe scarlet fever under such conditions, or, indeed, any disease of low infectivity, but accidents would happen just as in other methods of isolation. Of the few instances of the transmission of scarlet-fever infection, nearly all had been traced to some fault in the technique, such as the unobserved injured finger of a nurse, but the same danger would apply equally to blocks composed of single rooms. Much the same success had been obtained with diseases of higher infecting power in patients admitted at later and less infectious stages of the disease; but those who had admitted these diseases at the earliest stage had not been successful in avoiding the conveyance of infection to others; indeed, in chicken-pox admitted before the outcrop of the eruption the failure had been pronounced. It was interesting to discuss why failure arose in some diseases and not in others, but the broad fact remained that there had been failure under the best conditions of general management. As Dr. Harries had pointed out, it was easy enough to say with truth that one had treated a large number of infectious and other diseases in such a ward without cross infection, but in 1914 he had felt almost certain he could safely treat the diseases ordinarily sent into a "bed-isolation" ward were he to choose the day of the disease on which to send them there. Undoubtedly misconception had arisen because we did not fully realise that some diseases were much more infectious in certain phases; of this fact no better illustration could be given than Dr. C. Rundle's statement in 1912 that he had treated 41 cases of chicken-pox in his "bed-isolation" ward without cross infection, whereas the disease had been introduced accidentally into ordinary wards on 21 occasions, with cross infection in all but one instance. The explanation was now obvious, but was not realised by anyone then. He very much doubted if the cubicle block was any better than the "bed-isolation" ward, but the ordinary isolation block with single-bedded rooms, the doors of which opened on to the outer air and had no internal means of communication, was in his experience much more successful in the isolation of early measles and chicken-pox, mishaps being so rare as to point to some carelessness on the part of an attendant. On the other hand, those who had introduced measles and chicken-pox in the pre-eruptive stage to a "bed-isolation" ward had all failed, particularly badly with chicken-pox, since in the latter disease cross infection had arisen nearly every time. Of the seven exposures of chicken-pox at this stage in his ward, five were productive of the disease in others, and the two which failed to infect only endangered children who had already been exposed to a similar risk about a fortnight before. The experience of Dr. Goodall and Dr. Harries with chicken-pox at this stage appeared to have been similar to his, and as far as he was aware there were no other published experiences on this point. He thought there was little doubt that "bed isolation" could to some extent replace the single-bedded room, given suitable nurses. With regard to the reasons for failure of "bed isolation" wholly to replace the single-roomed block, he thought that in the earliest stages of certain infectious diseases infection could be conveyed through the air indoors by droplets, or some such means, for distances of 14 feet at least. It might be argued that attendants were less likely to be careless if working in a block of single-bedded rooms, because of the impression conveyed to their minds by the need for this complete isolation; or that in "bed isolation" the supervision of the ward was easier. In either case the supervision at night would not be complete and if the staff were good he did not think these arguments materially affected the case. He was not prepared to agree with Dr. Harries concerning the likelihood of infection of measles being human-borne rather than air-borne; and he did not think it would do to seek refuge in the reflection that it may be more difficult to wash from the hands certain infections, for if that was so the result in his single-roomed block could hardly have been so much better than in the "bed-isolation" ward.

Dr. D. MACINTYRE stated that, except in the case of chicken-pox, his experience of bed isolation was very similar to that of Dr. Harries. There appeared to be general agreement among those who had used the method that, excepting early measles and chicken-pox, most of the common infectious diseases could be safely nursed in a bed-isolation ward. This, he thought, marked a definite advance in our knowledge of the control of infection. With regard to chicken-pox, he had so far had no cross infection from this disease in the bed-isolation ward at Plaistow Hospital. Forty-two cases of chicken-pox had been safely treated in the ward during the past four and a half years. Some of these had been admitted in the first and second day of the eruption, but none had been in the ward during the incubation period. With measles his results had been different; cross infection had occurred during an epidemic in the spring of 1922, and again quite recently. Both failures had occurred when an epidemic had been at its height in the district and when the number of cases admitted to the ward had rapidly increased. During such epidemic periods patients admitted as scarlet fever and diphtheria were frequently found to be either suffering from or incubating measles, and it was often a difficult problem to isolate all these cases. He had made free use of the bed-isolation ward for this purpose, and his experience had led him to the conclusion that while measles in the eruptive stage could be controlled the number of such cases in the ward at the same time must be limited to one or two. The experiments carried out by Dr. Harries were very interesting, and he thought valuable knowledge might be gained by work along such lines. He entirely agreed with Dr. Harries regarding the value of a bed-isolation ward, especially in hospitals where small separate ward accommodation was limited.

Dr. HARRIES, replying, emphasised the importance of the time factor in connexion with the two experiments with *B. prodigiosus* detailed, and drew attention to the conception of "Velocity of Infection" due to Surgeon-Commander S. F. Dudley (Reports to Medical Research Council, No. 75). He believed that Dudley's theory applied to problems of bed isolation would prove of great value, and instanced his own experiences when acting as receiving officer at the base isolation hospital in Mesopotamia during the war. The method of collecting the infectious sick was for a launch twice a day to call at those depôts on the Tigris flying the yellow flag, and to collect in the same launch cases of most varied types of acute infections. The patients were placed on stretchers, and covered with blankets, and arranged on the floor of the launch. On arrival at Quarantine Island, the stretchers were removed from the launch, carried to the receiving room of the hospital, and again laid side by side on the floor. He had noted as many as ten different acute infections brought in at one and the same time: some water-borne, e.g., cholera and typhoid; others insect-borne, e.g., plague and relapsing fever; others, again, being such infections as small-pox, chicken-pox, and measles. In spite of the proximity of these patients in launch and receiving-room, he could recall no instance of cross infection over a period of many months. He ascribed this freedom of cross infection as in part due to (1) the types of disease, (2) the age-distribution of the patients dealt with, (3) protection by reason of previous attack, (4) the brief period during which proximity obtained, and (5) to the fact that the sick

Asiatic almost invariably covers his head with a blanket or garment. He agreed with the President that it was desirable to make the regulations for the working of bed-isolation wards as simple and concise as possible.

PARTICK AND DISTRICT MEDICAL SOCIETY, GLASGOW.

A MEETING of this Society was held on Feb. 21st, Dr. JOHN GRACIE being in the chair.

Dr. J. FERGUSON SMITH read a communication on

Furunculosis.

He said that his remarks were to be limited to the consideration of the state of having boils, as opposed to the treatment of the individual boil. There were two main factors in the production of a boil. One was the presence of pyococci, and the other was the presence of patulous hair follicles or ducts of glands by means of which the pyococci were enabled to reach the corium. Recent work had thrown doubt on the theory that the infecting organisms were those strains commonly found in the skin, and that these, by reason of some exaltation in their virulence, or depression of the resisting power of the host, became pathogenic. Recent work suggested that boils were produced by infection from a previous sufferer, and were due to pyococci quite distinct from those normally found in the skin. Later boils were thus lineal descendants of the primary boil or other septic lesion.

In the treatment of the condition the first essential was to remove any obvious predisposing causes such as scabies, pediculosis, and the friction of soiled clothing. The next was local antisepsis; a wet dressing should never be applied to any septic condition of the skin without the application of a strong antiseptic to the parts each time the dressing was changed. For this purpose Dr. Smith used perchloride of mercury, 1 in 1000 to 1 in 5000, depending upon the amount of inflammation and the texture of the skin; or acriflavine, 1 in 4000 in normal saline. Carbolic was irritating and relatively feeble. As the hands of the doctor and the patient carried the pyococci, attention should be paid to these. If these simple precautions were observed it was rarely necessary to have recourse to vaccines, the success of which was problematical. A vaccine should be autogenous, and given at four- to five-day intervals; an initial dose of 200 million should be gradually increased to one of 2000 million. Dr. Smith had had no good results from colloidal manganese; stannoxyl, he thought, had occasionally a good effect. He had not found that his patients were noticeably "run down" as a class, and while he treated the general health he did not think that such treatment helped greatly in the prevention of the furunculosis, except in cases of such gross disorder as diabetes. In conclusion, he mentioned what he considered to be the sheet-anchor of treatment—the use of X rays. These acted by producing a temporary partial atrophy of the skin glands and follicles, and thus deprived the cocci of their favourite nidus. The method was particularly applicable to localised furunculosis, as on the back of the neck and in the axilla.

SUSSEX THROAT AND EAR HOSPITAL.—The forty-fifth annual meeting of this hospital at Brighton was held on Feb. 6th. It was announced that in March leases of property adjoining the hospital, and belonging to the hospital, terminate, and the necessary legal formalities have been completed for the hospital to take possession. The extension comprises a waiting-hall, two consulting-rooms, a dressing-room, and an isolation ward, and it was announced that the governors had practically the required sum in hand. In-patients during 1923 numbered 663, an increase of 91 over the previous year, and out-patients had fallen from 1320 to 1002, due to the fact that on three occasions during the 12 months the hospital was closed to out-patients owing to infectious diseases.

Reviews and Notices of Books.

ORGANIC ARSENICAL COMPOUNDS.

By GEORGE W. RAIZISS, Ph.D., Professor of Chemotherapy, Graduate School of Medicine, University of Pennsylvania; and JOSEPH L. GAVRON, B.S., Associate in Research Chemistry, Dermatological Research Laboratories, Philadelphia. New York: The Chemical Catalog Company, Inc. 1923. Pp. 570. 35*s*.

THIS book of 570 pages is in the nature of a dictionary, with 1594 numbered references to a bibliography at the end of the volume. The "dictionary," in the present instance, discusses in more or less detail the single subject of organic arsenic. While there are to be found hundreds of original contributions to the chemistry and pharmacology of these bodies, distributed in dozens of scientific journals, the actual books dealing with the matter can be numbered on the fingers—this is certainly true so far as books printed in English are concerned. For this reason the authors deserve thanks for their painstaking effort in bringing the information together in up-to-date fashion. The book is issued under the auspices of the American Chemical Society "by arrangement with the Interallied Conference of Pure and Applied Chemistry, which met in London and Brussels in July, 1919," and thence the launching of this, and numerous scientific and technical monographs, passed by a sifting process to the hands of the Chemical Catalog Co. of New York City.

In the general introduction reference is made to Beilstein, Richter, and Ostwald specifically and the English and French dictionaries (non-specified) as available for study, but we should have liked to see an earlier acknowledgment to "Organic Compounds of Arsenic and Antimony," by Prof. G. T. Morgan, D.Sc., F.R.S. (Longmans, 1918)—the last mentioned is, of course, the English classic on this branch of chemistry—instead of occasional acknowledgment among the 1594 references at the end of the book. We view this failure to refer to an English chemist's classical treatise as unlucky, without any suggestion that it was intentional; but the omission should be rectified in any future editions.

The authors have aimed at including practically every organic arsenical compound reported in the literature up to date, they have consulted almost all the original articles and patents published in the English, German, French, and Russian languages, and there appears at the end of the volume a chapter on chemotherapy comprising 20 pages. The arrangement of the subject-matter in the body of the work is on correct lines, such as a chemist would expect. First there is a historical sketch of 17 pages; the trivalent aliphatic bodies with a little over 30 pages; then the pentavalent with a further 30, and then follow, systematically, unsaturated aliphatic arsenicals, and from page 103 onwards trivalent and pentavalent aromatic compounds, heterocyclic, miscellaneous compounds, and so on to the end.

In the historical sketch it is stated that the first recorded observations of the production of an organic arsenical compound, "Cadet's fuming arsenical liquid," were made in 1760 by L. C. Cadet de Gassicourt, a French military pharmacist working on an arsenical cobalt compound, with a view to making the best sympathetic ink. The events of 1914 and succeeding years make us wonder whether each of the participating nations proposes to keep its pet invisible ink a secret—we have seen nothing printed since the war on the matter. The American historical sketch proceeds almost exactly on the lines of Prof. Morgan's—excepting, of course, that the Englishman stopped in 1918, and, incidentally, has neatly arranged references at the bottom of each page. The subsequent work of Prof. Raiziss himself, Jacobs and Heidelberger, Fargher and Pyman, King, Wieland and Rheinheimer, and others are included in the American work.

Much of the work is of great value, and the result of learning, diligence, and research, but need we have had all that is given us? Let us take a critical example. It is known that manufacturers during the last few years found considerable difficulty in producing a body corresponding with the original neo-salvarsan, when proceeding according to the specifications in the German patent methods. On turning to page 195, we find an entire page devoted to seven different methods, or modifications of a parent method, by which to make novarsenobenzol. These are translations from Deutsche Reichspatente, Nos. 245756, 260235, 263460, 264014, and 271893. Knowing what a German specification has been in the past, and reading what the Medical Research Council recently had to say on the matter, the question was put specifically before a British firm with experience in the difficulty as to whether the methods given in this book would work. They replied (Feb. 11th, 1924): "... Though the directions could not be called purposely misleading, our works opinion is that not one of the directions, if followed closely, would give the desired product. One must regard these patent specifications as academic rather than practical, and as we have found it, the actual process of manufacture varies from every one of the patent specifications, and can only be arrived at by experiment and experience." Prof. Raiziss has himself worked on the compound, and has demonstrated the commercial drug to be a "non-uniform mixture of the mono- and di-N-methylenesulfinic acid derivatives of arsphenamin together with uncombined sodium formaldehydesulfoxylate, sodium sulfate and chloride." The page of erroneous patent specification directions might, therefore, have been omitted. We have counted the references to the D.R.P.'s on one page (p. 529) of the 15 pages devoted to the 1594 references. There are 22, in addition to three American and a few French and English. But a young and enthusiastic bench-worker who may think to hit on something novel may be disappointed, for search will probably show that all the *Ausgangsprodukte* are covered and hedged in by a network of patents, the mastery of which alone will cause him to wish he had the brain of a Bradshaw rather than of a Ramsay. There is, however, an advantage in having all these patent specifications collated in book form; they spur on the practical worker to find out how a compound is really made, and conversely how it cannot be made. Those who take out patents not seldom keep a "modicum" up their sleeves.

We congratulate Prof. Raiziss and his associate on their work in the chemotherapy chapter—and indeed on the entire book; but they do not countenance the most modern view of all, in criticism of Ehrlich's chemotherapy—viz., that a compound like salvarsan owes its activity to its organotropic rather than to its parasitotropic power.

MAN'S MENTAL EVOLUTION, PAST AND FUTURE.

By HARRY CAMPBELL, M.D., F.R.C.P. Lond. London: Baillière, Tindall and Cox. 1923. Pp. 74 + v. 3*s.* 6*d.*

THIS little book gives a survey of the mental progress of man from before the ape-stage to his present state as a social animal. Dr. Campbell follows MacDougall in regarding man's behaviour as essentially instinctive, and accepts Trotter's conception of the herd instinct; but he stresses the influence of intelligence, and decides that the more intelligent the person the more likely is his conception of right or wrong to conform to a code having for its standard the interest of others. This marks the distinction between Dr. Campbell and those who seek the explanation of certain a-social conduct in the influence of unconscious motives—a distinction of practical importance. He rejects the belief in any *élan vital* or "spiritual influx" by which the human race tends to advance intellectually or morally. Survival value is the thing that matters, and selection is still operative in man's moral evolution, so that he is probably becoming better adapted to the restrictions imposed by communal life. Dr. Campbell's thesis is clear and self-contained, but it may be doubted whether his premiss of individual moral evolution would be generally accepted. Morals are a matter of geography, goes the old saying; they are certainly a matter of history, and in overlooking social as opposed to individual evolution the author makes his task more easy but his results less convincing. The book would have been called "materialistic" a generation ago. It reminds us that there are established scientific theories with which modern psychology must be brought into accord.

EARLY TUBERCULOSIS IN ADULTS.

Die Klinik der Beginnenden Tuberkulose Erwachsener. By Dr. WILHELM NEUMANN, Privat Dozent at the University of Vienna. Vienna: Rikola Verlag. 1923. Pp. 158.

IN this monograph the author recounts the signs and symptoms of early tuberculosis in adults, and the means whereby early tuberculous changes can be detected. The subject is one with which every writer on tuberculosis attempts to grapple, and it is usually dealt with on conventional lines, inspection, percussion, auscultation, and the like, being described seriatim in a faithful and plodding manner. The author has, to a certain extent, digressed from this path; when he is conventional, he is helpful to the medical student and general practitioner, and when he is unconventional he has much to say that his fellow specialists will be interested in, and with some of which certain of them will disagree.

It is, perhaps, inevitable that the tuberculosis specialist should come to see signs of tuberculosis in almost every departure from the normal, just as alienists smell insanity in every eccentric trick and habit. Erythrism, or redness of the hair, is a case in point. The author distinguishes four different types of erythrism, and for almost every type the prognosis for tuberculosis is different. The red-blonde, whose hair is everywhere red, may suffer from latent or abortive tuberculosis, but never from phthisis running a malignant course. But such malignant phthisis is very common in the subjects of partial erythrism—i.e., persons with red hair on the pubes and face and in the axillæ, but not on the head. There are two varieties of this partial erythrism, according to the author, and the fourth main type is described by him as "hair disharmony," the possessor of, or sufferer from, which has a fuchsia-red moustache, but normal-coloured hair on his chin and pubes. This type is said to be prone to tuberculous peritonitis. Digressions on observations such as these stimulate research, but it is doubtful if many of them will stand the test of statistical investigations. The author deals almost as thoroughly with other parts of the body as with the hair. Differences in the colour of the iris on the two sides are referred to as degenerative stigmata which may or may not favour tuberculosis. The suggestion that there is more pigment in the iris on the side most affected by tuberculosis is well worth checking by the statistical method, and the value of this book would have been considerably enhanced if the author's correlations of various signs with tuberculosis had been supported by systematic comparative investigations.

BERGEY'S MANUAL OF DETERMINATIVE BACTERIOLOGY.

A Key for the Identification of Organisms of the Class *Schizomycetes*. Arranged by a Committee of the Society of American Bacteriologists: DAVID M. BERGEY (Chairman), FRANCIS C. HARRISON, ROBERT S. BREED, BERNARD W. HAMMER, FRANK M. HUNTOON. Baltimore: Williams and Wilkins Company. 1923. Pp. 442.

THIS is a work which cannot be adequately reviewed after mere perusal. It should be handled daily, in association with active work, before a weighed judgment as to its accuracy and usefulness can be arrived at. The prodigious and amazing energy, the breadth

of reading, and the tireless revision, which must have gone to its compilation, demand admiration for their mass alone. Everyone will admit that bacterial nomenclature is extremely unsatisfactory, and that in labelling such diverse forms as the organisms of the colon group, the spore-forming anaerobes, and the tuberculosis organism by the common name of bacillus we are reaching back to the very early and primitive days of the science. He who ventures to break fresh ground and propound an acceptable nomenclature is, however, venturing into a quaking bog. To the conservative British bacteriologist the book is at once a revelation and cause for distress. Gone are the time-honoured names and the traces of time-hallowed investigators which have always clung about them. *B. typhosus* (Eberth) finds no place in the index and has suffered transmogrification into *Eberthella typhi* (Eberth-Gaffky), Castellani and Chalmers. That reform and progress are both necessary and inevitable is a platitude, but we are not convinced that it is along the rigid lines laid down by our American colleagues that the most fruitful changes are to be made. In the end we shall probably be inconsistent, and whilst clinging to our old friends, such as the gonococcus, the tubercle bacillus, and *B. coli* (Escherichia coli), in other groups such as the spirochætes, we may adopt new suggestions.

It would greatly aid reference in this work if page-headings gave information as to the material dealt with instead of monotonously repeating the title of the book. An enormous number of species is included, some 850 odd being described, and we are dubious as to the advisability of lending countenance to the perpetuation, with specific rank, of saprophytic forms which have no commercial, pathological, or biological importance. Those who in the past have catalogued endless intestinal or other organisms upon such slender bases as sugar reactions, which probably are almost infinite in their possible combinations, have rendered an ill-service to bacteriology, and the the perpetuation of this kind of folly is quite undesirable. A short note upon the existence of such forms without detailed description would save much space for more important micro-organisms. The book contains no list of synonyms; no doubt these are intentionally excluded to enforce adherence to the nomenclature put forward. A valuable contribution to its subject, this work will doubtless find its way into all bacteriological laboratories; but it seems to prove the impossibility of its mission—the application of a binomial to the adequate designation of every known organism. Is the attempt worth it? We think not. Words are not so precious that so vast an amount of labour should be expended in bolstering up this botanical fetish.

PHARMACEUTICAL AND FOOD ANALYSIS.

A Manual of Standard Methods for the Analysis of Oils, Fats, and Waxes, and Substances in which they Exist; together with Allied Products. By AZOR THURSTON. London: Chapman and Hall, Ltd. 1923. Pp. 416. 21*s*.

THE title of this work is misleading, as it deals in general with the analyses of oils, fats, and waxes, as set out in the subtitle. Until the preface is read, there is no indication that the subtitle constitutes Part I., Part II., dealing with the analysis of the more common drugs and foods, being now in preparation. In future editions we would suggest that the division into Parts I. and II. should be made clearer or that other appropriate and distinctive subtitles be adopted. The first four chapters are concerned with polariscopes, refractometers, and the determination of specific gravity by various means, and general methods of analysis. Subsequent chapters are devoted to the commonly occurring oils, fats, and waxes, dairy products, flesh foods, eggs and egg substitutes, and the volatile oils. At the end of each section a bibliography up to date (1922) is attached, comprising the prominent American and English journals, all original articles appearing in these journals being included regardless of their importance. The absence of a name index is to be regretted.

Apart from these criticisms, the book is undoubtedly good, and it is a useful contribution to this important branch of chemistry. Indeed, this is to be expected from Mr. Thurston's long official association with American Food and Agricultural Departments. Not the least valuable portion is the list of adulterants based on the Federal notices of judgments, so far as these have a bearing on the subjects dealt with in this volume. It is obviously important that the analyst should know what adulterants are being used.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

X.—OBLIGATIONS TO HIS PATIENT.

BY JAMES NEAL, M.R.C.S. ENG.,
GENERAL SECRETARY OF THE MEDICAL DEFENCE UNION.

Aegroti salus suprema lex.

IT is the duty of a medical practitioner to place the interests of his patient above all other considerations, and to do his utmost to promote his patient's welfare. The British Medical Association has expressed the opinion "that a medical practitioner should not under any circumstances disclose voluntarily, without his patient's consent, information which he has obtained from that patient in the exercise of his professional duties." It may be said that this opinion is universally accepted.

Implied Warranty and Contract.

The fact that a medical practitioner is registered is an implied and public warranty on his part that he possesses the requisite ability and skill, and in every case that he attends he is legally bound to employ a reasonable amount of knowledge, skill, and care. In the absence of a definite arrangement that he shall not be paid, a medical practitioner is entitled (unless restrained by such a by-law as that of the Royal College of Physicians) to be reasonably remunerated for any professional services he may render. There is, however, nothing to prevent a medical man from attending a patient on the understanding that his services shall be gratuitous. It is commonly understood that a medical practitioner is at the beck and call of anyone who chooses to send for him. This is not the case. There is no law to compel a medical man to attend a patient, apart from any contractual obligation he may have accepted, but if he once undertakes to do so, he must not go back except at his own risk. Even if he is attending a case gratuitously, and wishes to withdraw from it, he should give the patient a reasonable opportunity of obtaining other medical assistance before he ceases attendance.

The relationship between a medical practitioner and his patient is one of contract, though usually the contract is only implied by the rendering of services by the medical practitioner for which he can claim to be reasonably remunerated. It is as well that the scale of such remuneration should be agreed with the patient at the outset, whenever possible, to avoid misunderstandings. It should never be forgotten that a medical practitioner has no right to do anything to a patient without his consent, or, in the case of a child, without the consent of the parents or guardians, save in emergencies when the medical practitioner must exercise his discretion. This applies not only to operations, but to mere examinations or any form of

treatment. When surgical operations are necessary, the ideal thing is to obtain the patient's consent in writing, and as the full extent of the operation frequently cannot be determined beforehand, it is well for the surgeon to get a written authority to exercise his discretion when the exact conditions are ascertained; but in practice this ideal can but seldom be attained. No surgeon can exceed the extent of his authority without some risk of laying himself open to a charge of assault.

Allegations of Negligence.

Everyone engaged in active practice, whether as general practitioner or as consultant, is liable in the ordinary course of his daily work to false charges, sometimes very serious, of professional negligence or incapacity. However well-informed a medical practitioner may be in his professional work, and however careful he may be in his treatment of a patient, he is always at the mercy of any person who may feel aggrieved. All that seems necessary from the patient's point of view as a foundation for an action for negligence or malpraxis is for him to conceive the idea that however serious his disease or injury may have been, he ought to have made a more rapid recovery or obtained a more perfect result. He bolsters up his claim with items for loss of wages, loss of health, nervous shock, expenses for visits to the seaside, massage, and the like, hoping that the practitioner will submit to his demands for compensation rather than face the ordeal of a public trial. No doubt it is a great temptation to settle a claim of this kind by a small monetary payment, and so avoid the publicity necessarily involved in court proceedings, but every case that is fought and won will help to protect other practitioners from having to face similar claims.

The majority of the allegations of negligence are set up as a counter-claim against the payment of professional fees. Fortunately, it is not sufficient for the plaintiff merely to contend that he has received no benefit from the treatment. If a practitioner has exercised due care and ordinary skill, he is entitled to be paid, although his treatment is unsuccessful. The mere employment of a medical practitioner does not imply a contract to perform a cure, but only that the medical practitioner will exercise reasonable care and skill, having regard to his position and standing in the profession.

But a patient is entitled to recover damages in respect of any injury caused through neglect or lack of skill on the part of his medical attendant, and it is a question for the jury in each case to say whether any injury is attributable to the want of a reasonable and proper degree of care and skill in the practitioner's treatment. If the jury finds that there was a lack of care and skill on the part of the medical practitioner, having regard to his status and experience, he will be held liable, but he will not be answerable merely because some other doctor might possibly have shown greater skill and knowledge.

In other words, a medical practitioner is not expected to show the highest possible skill, but he must have that amount of skill which should be possessed by a practitioner in his position. Accordingly, the degree of skill expected from a specialist will not be required from a country practitioner remote from teaching centres.

How to Meet Such Allegations.

A medical practitioner who is so unfortunate as to have his professional work called in question should make no reply to the allegation until he has been properly advised; it is impossible to emphasise too strongly the great protection which a practitioner derives in all such cases from membership of an experienced defence organisation. Too often when such cases come under notice, it is found that the position has been gravely prejudiced by injudicious letters which the practitioner has written without recognising their possible effect, and in too many instances without even keeping a copy. Errors in diagnosis are not necessarily due to negligence, and no guarantee is given or implied that a medical practitioner will diagnose correctly the ailment from which his patient is suffering. Questions of this kind frequently arise in connexion with the notification of infectious diseases, and it is seldom that an adverse verdict has been given.

Special care is necessary in dealing with cases of criminal wounding, as, if the patient should die, the person who caused the wounding may be charged with murder, and may set up the defence that but for negligence and unskilful treatment the original wound would not have been fatal. In all such cases the medical practitioner should be prepared to justify every step which he takes, and in grave cases should consult whenever possible with an experienced colleague. The most careful notes should be made in writing of the patient's condition when first seen, and his progress from day to day, with full particulars of all treatment afforded.

The introduction of X rays as an aid to diagnosis, and as a method of treatment, has given rise to many claims in respect of injuries received as a result of their use. Negligence may be alleged either with regard to the application of X rays, or even in not resorting to them. The desirability of requiring a patient to sign some form of acknowledgment of the risks attaching to the use of X rays, and his willingness to take such risks, has been frequently discussed, but no such acknowledgment would protect a practitioner from an action being brought against him for alleged negligence, and it might even be argued that its possession might have made him less careful than he otherwise would have been.

It must be remembered that a surgeon is held responsible for negligence on the part of those helping him at an operation. At such a time the surgeon is supreme, and assistants and nurses, although employed by a hospital at which the operation is being performed, cease for the time being to be servants of the hospital, and take their orders from the operating surgeon alone. The hospital does not as a rule incur responsibility, provided it has exercised due care in the selection of its medical and nursing staffs.

A Word about Gifts.

Owing to the peculiarly intimate relation of a medical practitioner to his patient, any business transaction between them must be fair and above-board, and it is essential that the patient be fully aware of what he is doing. There must be no possibility of a suspicion of undue influence on the part of the medical practitioner for his own benefit. This necessarily applies to any gifts from a patient to his doctor, and even to wills, whereby the medical attendant will benefit, except that in the latter case undue influence cannot be presumed, but must be proved, in order to invalidate the will. The influence which a medical practitioner necessarily and naturally possesses over his patient would not of itself be a ground for setting a will aside, unless it could be shown that the testator was coerced into doing what he did not really desire to do.

PRESENTATIONS TO MEDICAL MEN.—The retiral from practice of Dr. James Duffus, of Auchenblae, Kincardineshire, is fittingly commemorated in a public testimonial, subscribed by his many friends in the district which he served for 40 years. In addition to his professional duties, which won for him the highest esteem, Dr. Duffus has always taken an active part in the public, social, and recreative life of Kincardineshire.—A public presentation was made recently to Dr. W. C. Rigby of Adlington, Chorley, Lancs, from members of the local branch of the St. John Ambulance Brigade and other residents in recognition of his public services in Adlington and district. For some 28 years Dr. Rigby has been an enthusiastic supporter of the Ambulance Association, to which he devoted much of his leisure as instructor and examiner.

THE LANCET.

LONDON: SATURDAY, MARCH 8, 1924.

HARNETT v. BOND AND ADAM.

A SUMMARY is published in another column of the case in which Mr. W. S. HARNETT obtained heavy damages for detention as a lunatic while he was sane against Dr. C. H. BOND, Commissioner of the Board of Control, and Dr. G. H. ADAM, proprietor of the West Malling Private Mental Hospital. There is no doubt of the importance both to the public and the medical profession of the questions exposed in this case, and those who agree and those who disagree with the verdict alike will feel the need for new legislation which has long been overdue and which has been made the subject of definite ministerial promises. As we are informed that there will be an appeal from the verdict, and also that further legal action may be taken by the plaintiff, most of the particular aspects of the case cannot now be reviewed; but the evidence revealed in an unmistakable manner how serious is the responsibility which is laid upon our profession in regard to the certification of lunatics In a case where a jury has found that a terrible wrong has been suffered and that proportionate penalties (if possible) should be inflicted, it is right to express a double sympathy; and this can be done without prejudice to any subsequent proceedings. The paradoxical sentiment is the result of paradoxical law, which imposes upon medical men the duty of saying yes or no to questions that, in the present state of our knowledge, cannot always be met with such definite replies.

The verdict would clearly be wrong if convincing evidence had been forthcoming that the plaintiff was insane throughout his period of detention, but the jury came to a contrary decision with no difficulty whatever, being satisfied that many of the alleged symptoms of lunacy were capable of other interpretation, presumably whether considered separately or en masse; and therefore a large pecuniary compensation became immediately logical. In fact, no money compensation could meet the case. Accepting the definite finding of the jury that the plaintiff was not of unsound mind on the day when he was sent back into detention, and further, that he was not dangerous to himself or others but was fit to be at large, the question of whether those responsible for his detention believed that he was insane, and took all the necessary steps to ascertain that this belief was duly founded, presents to us two difficulties. The first is how the defendants, specialists though they might be, were to arrive at a definite decision of what makes a man a lunatic—that is a more definite decision than their judgment dictated; and the second is what procedure should they have adopted, other than that which they did as a matter of fact adopt, in answer to their convictions. In the evidence for the plaintiff an acknowledged authority was quoted as stating that there was no one who is absolutely sane, it being all a matter of degree. This is the position which influenced the actions of the defendants, and which makes it amazing and horrifying to medical men that the jury should have found that Dr. BOND was aware of the plaintiff's sanity at the time when he was taking measures to return him to confinement. We cannot follow this decision while it is widely admitted that there is no definite criterion of insanity. We have been unable to ascertain what steps can be taken legally to revoke a leave of absence granted to a certified man. This confession of ignorance of the law need not be concealed, when the learned judge has himself expressed surprise on learning that the certified lunatic is not personally made aware of the grounds of his detention. As this point has been made the subject of considerable comment, it ought to be quite clear that the information would not be withheld from the legal representative of the alleged lunatic, while the reticence as far as the certified person is concerned has its foundation in the hope that recovery may ensue. In such a happy event it might reintroduce into family life exactly the trouble which had been surmounted, if the person restored to his relatives should ascertain through whose instrumentality and on what grounds his segregation had been held medically necessary. A patient's continued detention rests not on the certificate, but on his mental state at a particular time.

Whether the judgment on appeal holds good or not, makes no difference to the fact that the lunacy laws must be amended. Medical men cannot face the risk under which, it seems, they lie at present, and for their protection, as well as for that of the public, the sooner these reforms are instituted the better. And within the medical profession the need for schools of psychiatry will now be recognised more fully. Three years ago, at an important meeting of the Medico-Psychological Association, Dr. BOND outlined the necessity that clinics should be held in mental disease in affiliation with general hospitals. He pointed out the relation which such clinics would occupy with regard to other clinical units, and laid stress upon the advantages to the medical profession of acquiring greater skill in the differential diagnosis of mental disorder. This reform, which has been advocated steadily in these columns, would obviate many of the difficulties with which lunacy certification is surrounded. But far more is required; and we welcome the decision of the Prime Minister that, prima facie, there is a case for full inquiry. This inquiry will probably follow immediately upon the result of any appeal, and, we imagine, will lead to vital alterations in the law.

ON WASHING AND ASEPSIS.

IT is one of the earliest recollections of our boyhood that we regarded washing as an effeminate superstition, and now, after many years, we find our instincts vindicated and our views upheld by no less a person than the Assistant Master of the Rotunda. In the important and suggestive article on surgical asepsis which we print on another page Dr. G. W. THEOBALD and Dr. J. W. BIGGER produce strong evidence that prolonged washing, far from sterilising the hands, serves only to bring up more bacteria to the surface, and if, as is usually the case, the hands be then inserted into wet gloves, an emulsion is formed, swarming with organisms ready to escape at the smallest puncture. They would insert "socially" clean hands into dry unsterilised gloves, which they wash and immerse in an antiseptic solution, and they hold that the result is entirely satisfactory. Now, there can be no doubt of the folly of imagining that the hands can be sterilised by washing, however prolonged, and indeed, unless elaborate precautions are taken the practice may be absolutely dangerous. We have known of more than

one case where a severe dermatitis was produced by scrubbing the hands with an infected nailbrush. The smooth surface of a rubber glove lends itself much more readily to mechanical cleansing, whilst it is not injured by the action of antiseptics which would ruin the skin. For the performance of dressings, or minor surgical procedures, and of those complicated obstetric manœuvres where perfect asepsis is a practical impossibility, there can be no doubt that the method suggested is admirable and far superior in actual results to the more complex methods in general use. Moreover, it is so simple that it can be carried out by individuals and under circumstances where the ordinary routine would certainly fail.

There are, however, certain criticisms which we feel bound to offer to the method proposed, since they seriously affect its value for the work of the general surgeon. It is an essential part of the method that some reliance is placed on antiseptics, and in particular on 1/1000 biniodide of mercury. Now, recent work has shown that, in general, mercurial solutions merely prevent growth and do not destroy bacteria. If the mercury is precipitated by means of hyposulphite of soda the organisms will in many cases be found to grow with undiminished vigour. Observers have seen thin fragments of infected tissue incubated in 1/500 biniodide for three months, and at the end of that period a few grains of hypo produced a rejuvenescence as startling as that attributed to salt taken in the morning tea. But no such precaution appears to have been taken in the tests described, and we must for the present feel a certain hesitation in accepting, sine grano salis, the statement made that gloves infected with virulent pus can be sterilised by mechanical washing and the use of dilute antiseptics. In the doctrine of abstention our authors are on much safer ground, and we should have liked to see them carry it somewhat further. The most perfect practitioner of the art we have ever heard of refused to shake hands except in gloves, or to button his own boots, and he never touched coins with bare hands. Needless to say, he had no sense of humour, but his surgical asepsis was perfect. Without going quite so far it would be well that every student should be taught how much easier it is to avoid infection than to remove it. In the ideal clinic no piece of dressing, clean or infected, should ever be touched by the hands, gloved or ungloved, but only by forceps which have just been boiled. Were such a regime rigidly enforced the transference of organisms from one patient to another would become virtually impossible, and this after all is the practical meaning of surgical asepsis.

It is the prevention of transference, with its inevitable corollary of the development of bacteria of exalted virulence, that is the foundation of modern surgery and obstetrics. In the old days surgeons were not even "socially" clean, and wore, we are told, frock coats stiff with the blood of years of practice. We have long got rid of such gross and open sepsis, but it still behoves us to be on our guard. It would be well if surgeons, dressers, and nurses would bind themselves, under a solemn vow, never to touch a dressing with aught but forceps, never to touch infection with a hand ungloved, and never to put a hand where an instrument would do as well. In many a ward asepsis would be enormously improved if washing between dressings were strictly forbidden. Yet there is moderation in all things, and perhaps the dangers even of washing can be exaggerated. It is only over the doors of the laboratories of a certain branch of science that its more advanced votaries have inscribed the motto, "All soap abandon ye who enter here."

THE INVESTIGATION INTO FOOT-AND-MOUTH DISEASE.

THE loss to the agricultural interests of this country caused by the epizoötic of foot-and-mouth disease, now fortunately abating, may be partly realised from the statement that the estimated gross sum involved in compensation amounts already to over £2,900,000. This, moreover, is no true measure of the disaster from the point of view of the farmer deprived of valuable pedigree or dairy stock, and suffering from interrupted farm and dairy business; nor does it take account of the injury to farm hands who have lost employment or of the inconvenience to the general public. The enormous importance to the country of acquiring control of this disease, and the devastating effect of want of knowledge concerning some of its essential features, have now been widely realised by all classes of the community. The actual presence of the scourge has forced all concerned to recognise the need for a thorough inquiry; while at the same time it has counteracted the timidity which shrank from facing the really small but often greatly exaggerated risks involved in conducting experiments with the virus. The personnel of the committee appointed to conduct an inquiry and to initiate and direct research has been announced (see p. 521), and it is to be hoped that before the country has thoroughly recovered from the epidemic the institution of well-planned research will have been faced and accepted, and its safety recognised. We sincerely trust that this time vows uttered in distress will not be put aside when the period of immediate danger is over. It is indeed remarkable that with so serious a calamity as an extensive epizoötic of foot-and-mouth disease hanging continually over the country so little demand for persistent research should have been made.

There is still great uncertainty about many of the important factors producing both initial outbreaks and subsequent extensions of foot-and-mouth disease. The highest authorities express divergent views on such fundamental matters as the possibility that fodder or litter from abroad, even from South America, could carry the infection to this country. Again, in spite of diligent inquiries and a great desire to learn the truth, we are almost entirely ignorant as to how it happens that outbreaks occur in unexpected places, sometimes 50 or 100 miles from the nearest antecedent infected area. An instance is the recent outbreak in Scotland which, according to Sir STEWART STOCKMAN, is only the second such occurrence north of the Border in the last 22 years. No better explanation is forthcoming than the possible transmission by an untraced human being, by birds, or by vegetables from the continent, the source of infection in any case being purely suppositional. It is not so much the unexpected appearance of cases of disease which causes surprise as the absence of definite knowledge whether it is even possible for any of the suggested means of transference to be effective. One reason for our ignorance as to the means of transmission may be the uncertain infectivity of material from diseased animals. Saliva and the contents of vesicles sometimes contain extremely concentrated virus; in other cases these materials appear to be inert. This variation may be strictly dependent on the stage of the disease, as Vallée has suggested, but in any case no "virus" from affected animals, however probable its activity may appear, can be assumed to be virulent without being tested.

Whilst much of the evidence adduced is necessarily inconclusive and circumstantial, the accounts by veterinarians of epizoötics of foot-and-mouth disease, and the means taken to combat them in different countries, contribute suggestive data for further scientific inquiry. In the current number of the *Veterinary Journal* much information of this kind has been collected, together with a brief survey of the present epizoötic. The method of dealing with outbreaks, and the results obtained in Switzerland, by

Prof. M. L. PANISSET, are of special interest on account of the thoroughness of the regulations and the care with which they appear to have been carried out. A stricken farm was surrounded with barbed wire, all ingress or egress of man or animals was forbidden, and small animals such as fowls, cats, and rabbits were destroyed. Nevertheless, though these efforts had a certain effect early in the epizoötic, we are told the spread of disease was not prevented. If, as the small amount of published experimental work suggests, inanimate objects can only retain the virus in an active state for a very short time, then the possible transmission by actually infected birds, rats, mice, rabbits, cats, and the like, becomes a more important subject for inquiry. Some most interesting experiments bearing on this question were published by Prof. J. M. BEATTIE and Mr. D. PEDEN in THE LANCET of Feb. 2nd. These writers are inclined to believe that they infected rats with foot-and-mouth disease by feeding them on the lymphatic glands of diseased cattle. The rats showed vesicles on the tongue and feet, and other rats were infected from them. The disease produced had a striking resemblance to experimental foot-and-mouth disease in the guinea-pig. Unfortunately they were hampered by want of a further supply of virus, and by lack of opportunity to determine by experiments on cattle or sheep whether the infected rats really suffered from foot-and-mouth disease or not.

No statement has yet been published as to the conditions under which research will be conducted through the newly-appointed committee. On those dealing with so complex a task no unnecessary restriction should be imposed. Fortunately it is possible to infect guinea-pigs and to carry on the disease by passage in these animals alone, but it is necessary at times to confirm the diagnosis of the disease in rodents by testing the virus on susceptible ungulates, and space will be needed for keeping and isolating a number of large animals of the kinds most susceptible to the disease. Researches on birds and small mammals can, no doubt, be carried out without risk in properly equipped laboratories, and it is hoped facilities for obtaining virus for this purpose will be given to responsible pathologists who are well qualified and well situated for the conduct of such intricate work. If an experimental farm were established, virus could be given to recognised pathologists, and material of real importance could be tested on large animals; then work similar to that of BEATTIE and PEDEN would be encouraged and brought to fruition. The accommodation necessary for large farm animals would be considerable, and it would be important to avoid clogging the wheels of research by making demands for unnecessary tests. For the purpose of coördinating the associated activities of pathologists in different places the committee will, no doubt, prove efficient. One of the most important and by no means easy duties of an experimental station is the maintenance of a supply of virus. This must be provided for by passage in animals, and also by preservation of a stock of virus in cold storage. The question of "carriers" amongst recovered animals which harbour and distribute the virus, especially in connexion with deep infections of the hoof, is another point to be investigated.

While the natural means of transmission and the measures available to frustrate them are of great importance, especially in this country, the intimate nature of the virus and its possible cultivation in artificial media must not be neglected. The hope implied in this latter inquiry is that means of producing a more certain and lasting immunity than can be obtained by any known method may be discovered. The whole question of immunisation by serum or blood, and the questions of vaccine and serum therapy, are still far from being satisfactorily settled, and it is possible that the efforts of a committee appointed to investigate this one affliction may result in clearing up fundamental points common to many diseases.

Annotations.

"Ne quid nimis."

THE DANGER OF FROZEN SCHICK SERUM.

WE have received through the Registrar of the General Medical Council a copy of the following despatch from H.M. Consul-General at Boston, U.S.A.:—

SIR,—I am not aware whether the discovery, announced in to-day's local Boston press, that Schick serum becomes poisonous when frozen, is generally known in medical circles at home, or how far the use of this serum for inoculation against certain diseases is practised in the United Kingdom. It therefore appears advisable to report the alleged discovery which is stated to have arisen from the poisoning of 19 students at Concord Academy. Freezing, it is stated, destroys the antitoxin in the serum, and leaves nothing but the poison to be administered. It is expected that the effects of the poisoning will only last about two weeks, the patients being kept in darkened rooms for three weeks as a precaution. It is announced that the entire shipment of the serum used is to be destroyed.

British Consulate General, Boston, Feb. 7th, 1924.

This occurrence received notice in the *Journal* of the American Medical Association for Feb. 16th, when the number of affected institutions was given as two and the number of students affected as 44. At the request of the Massachusetts State Commissioner an investigation was made into the circumstances by Dr. W. T. Harrison, of the U.S. Public Health Service, with the help of Dr. Bela Schick, Dr. W. H. Park, Prof. M. J. Rosenau, Dr. Hans Zinsser, and Dr. E. H. Place. It appeared that certain phials of two lots of diphtheria toxin-antitoxin mixture which had passed all the usual tests were exposed after distribution during the recent extremely cold weather to temperatures of 0° F. or lower. Hundreds of other phials of the same lot numbers, not exposed to low temperatures, were used in other cases and produced no unusual reaction. Laboratory experiment showed that while a short period of freezing did not materially affect the toxin-antitoxin mixture, severe freezing for 18 hours apparently caused the antitoxin to dissociate from its combination with the toxin and to assume a changed physical state. The experts consulted viewed the occurrence in the light of a discovery of which note should be taken, but which should in no wise discourage the use of toxin-antitoxin mixtures for protection against diphtheria. The results of the injection of serum which had been frozen could not have been foreseen and no blame was attached to anyone in connexion therewith. The Massachusetts Commissioner added that his confidence in the value of the serum was in no way altered and that experiences such as this, distressing as they must be, should not cause health officers to abandon the use of a valuable preventive measure. At the time of the report all the patients were recovering.

RADIOTHERAPY FOR SARCOMA.

THE Radium Institute in Paris has issued in *Paris Médical* for Feb. 2nd a report, signed by MM. C. Regaud, J. Roux-Berger, J. Jolly, A. Lacassagne, H. Coutard, O. Monod, and G. Richard, on the treatment of sarcoma with the X rays and radium. The chief lesson of this paper is that the term sarcoma covers a very mixed collection of new growths, whose origin, structure, degree of malignancy, clinical evolution, and response to radiotherapy vary so greatly that the first need is for a more accurate classification of this group of growths. But of its malignancy and refractoriness to treatment in most cases there can be no doubt. Of the 62 patients treated at the Radium Institute in the years 1919, 1920, 1921, only 16 were still alive at the beginning of 1923, and the permanency of the recovery in these 16 cases could certainly not be guaranteed. Of the 25 patients suffering from lymphoid sarcoma, eight were treated with the X rays alone, five with radium alone, and ten with the two

methods combined. There were also two patients who were given combined radiotherapy supplemented by operative interference. Early in 1923 six of the patients in this group were still alive, and of the 19 patients who had died, nine had been rid of their primary lesions, and several had for more than a year enjoyed apparent recovery. Of the remaining ten patients none had achieved local recovery, although some diminution of the primary growth had taken place, and in almost every case there had been appreciable amelioration. It would seem that radium is to be preferred to X ray treatment only in exceptional cases, and that X ray treatment is capable of achieving local recovery in most cases of lymphoma and myeloma. The metastases, which are so very common, presumably start before the successful treatment of the primary lesion is instituted, and this fact is the chief stumbling-block to both radiotherapy and operative treatment. There is another difficulty connected with radiotherapy in sarcoma. Some sarcomas are much more radio-sensitive than others, and were it possible without injury to the patient to make an exploratory excision and identify the histological characteristics of the new growth, radiotherapy could be reserved exclusively for cases which were radio-sensitive. In the absence of a preliminary microscopic examination, radiotherapy is rather empirical, and an exact opinion on the nature of the growth cannot well be formed till its reaction to this treatment is observed. While operative treatment is usually ineffective and often disastrous in cases of lymphoma and myeloma (unless a myeloma of a limb can be removed by amputation) X ray treatment is justifiable in such cases. But operative treatment is to be preferred in cases of fibroplastic sarcoma, because this is usually very radio-resistant.

THE PHYSICIANS' LIBRARY OF PHILADELPHIA.

THE Library of the College of Physicians of Philadelphia enjoys an endowment consisting of some 28 separate "funds" for the purchase of works of especial interest, and the Fund for Rare and Valuable Books has enabled it during 1923 to add to an already incomparable collection of incunabula. "These fifteenth century books," says the learned librarian, Mr. Charles Perry Fisher, "have been acquired for the library without in any way interfering with the purchase of current medical publications." The Philadelphia librarian and his committee have thrown their net widely, and have now included in their list a number of works not strictly medical, such as those of Boethius, the Epigrams of Ansonius, the "Noctes Atticae" of Aulus Gellius, the works of the Christian Father Lactantius, and of others, who were rather doctors of theology than of medicine. We note the very rare first edition, printed in Paris in 1517, of the "Tractatus insignis et exquisitissimus de superstitionibus contra maleficia seu sortilegia que hodie vigent in orbe terrarum," by Martinus de Arles y Andosilla. Two old French works on the care of the teeth and on the medical education of children are of interest considering that they were published at a time when these subjects—by us considered so recent—attracted no particular attention. These are Bourdet's "Soins faciles pour la properté de la bouche, et pour la conservation des dents," published by Mourer at Lausanne in 1782, and Brouzet's "Essai sur l'éducation médicinale des enfans," two volumes, published by Cavelier in Paris as early as 1754. A very interesting English work—considering its early ante-Harveian date—is Walter Charleton's "Three anatomic lectures; concerning the motion of the blood through the veins and arteries; the organic structure of the heart; the efficient causes of the heart pulsation." This was published in London by Kettilby in 1583, when William Harvey was five years old. Non-malignant tumours were in the past constantly mistaken for true cancer, whence such a work as Edward Guy's "Practical Observations on Cancers and Disorders of the Breast, explaining their different appearances and events. To which are added one hundred cases, successfully treated without cutting," London, 1762. The plague was long believed to be contagious; hence Sir Arthur Brooke Faulkner's "Treatise on the Plague, designed to prove it contagious, from facts, collected during the author's residence in Malta . . . in 1813." One work on "anthropology" figures in this fascinating library report. The term was anciently used to mean a description of a man, rather than of man at large, but even so we question whether we can rank under this heading the "Anthropologia" of Magirus (published at Frankfort, 1603), "hoc est, Commentarius . . . . Philipp. Melancthonis libellum de Anima." We take it that the book is not a commentary by Magirus on Melancthon's work, but that both rank as anthropology in the ancient sense. "Anima" as used by Melancthon is a theological term, and does not refer to physical breath. All in all, this great medical library now contains over 140,000 volumes and represents worthily a great tradition.

A NEW METHOD OF RATIONING ARTIFICIALLY-FED INFANTS.

ARTIFICIAL feeding for infants is rapidly becoming an exact science, and the margin of error due to the personal equation is yearly being reduced. The latest advance in this direction has been made by a Danish physician, Dr. H. Trepka Bloch, who has recently published [1] an account of a new method of rationing artificial meals for infants. The method, which is ingenious and carefully thought out, is particularly well adapted for the use of unskilled persons—indeed, it might almost be described as fool-proof. Briefly, it consists in the use of a gauge-glass, 8 inches high (here shown rather less than half-scale [2]), shaped like an ordinary urinometer, on which are engraved two scales, one for milk and the other for water. The divisions on the scales indicate the quantities required for each feed in the 24 hours by a baby of average weight for every week of its age, up to six months in the case of milk and five months in the case of water. The milk is poured into the gauge-glass up to the line on the milk scale which indicates the age of the infant. Water is then poured into the milk up to the line on the water scale on which the same age is indicated. The infant is thus at any given time receiving the exact dilution appropriate to its age, until it is six months old, when it should be taking undiluted milk.

The graduations of the gauge-glass have been calculated on the basis of the curve of weight of artificially reared infants published by Camerer, and are such as to secure that an infant of average weight for its age receives in the 24 hours 100 calories per kilo. of body-weight—this number representing what the consensus of expert opinion has laid down as the optimum requirement of an infant. While the scale is arranged for infants of average weight—that is, for babies weighing between 3 and 3½ kilos. (between 6½ and 7½ lb.) at birth, infants of more than average weight may be given the larger quantities and stronger dilutions calculated for half or one month ahead of their age; and, conversely, a small or marasmic baby may with equal facility be given correspondingly reduced mixtures. Indeed, in many cases the age need not be taken into account at all, since Dr. Bloch has supplied a table showing the calorie value, with a given number of meals, of the 24 hours' ration, with each graduation of the gauge-glass, and all that will be necessary will be to

[1] Særtryk af Ugeskrift for Læger, 1923, Side 124.
[2] The gauge-glass is manufactured by Messrs. H. J. Elliott, 20, Cross-street, Hatton-garden, from whom particulars may be obtained.

Table of Milk Mixtures Determined by the Gauge-Glass.

End of—	Ratio of milk to water.	Each feed: milk water.	Number of meals.	Quantity in 24 hours.	Calorie value of each feed (milk).	Calorie value in 24 hours (milk + sugar).	Weight curve of artificially reared infants (Camerer).
0 week	1-2	10 +20	8	240	6·5	71	about 3300
1 ,,	2-3	20 +30	8	400	13·0	136	—
2 ,,	3-4	30 +40	8-7	490-560	19·5	175-201	—
3 ,,	1-1	45 +45	7	630	29·2	254	—
1 month	about 3-2	67 +43	7	770	43·9	368	3683
2 ,,	,, 2-1	82 +43	7	875	52·7	438	4388
3 ,, / 13 week	,, 3-1	112 +38	6	900	72·9	509	5093
4 month / 17 week	,, 5-1	128 +37	6	990	83·3	580	5800
5 month / 22 week	7-1	175 +25	5	1000	114·2	650	6508
6 month / 26 week	Undiluted milk.	200 0	5	1000	130·0	730	7278

weigh the infant and to begin the feeding at the line on the gauge-glass corresponding to the number of calories needed for that particular weight.

In the following table 100 g. of milk are assumed to yield 65 calories, corresponding to 3·7 per cent. of fat. Even where the percentage of fat is increased or reduced by 0·5 per cent., the difference will only amount to six or seven calories per kilo.—an error which may quite well be regarded as negligible. The quantity of sugar to be added to the feeds is given as 2 per cent. (two level teaspoonfuls) for each half-litre of milk and barley-water—a proportion used in Denmark for many years—which will approximate to the 7 per cent. of sugar in human milk. 100 g. of sugar are assumed to yield 410 calories, 2 per cent. of sugar giving about 80 calories per litre.

It will of course be self-evident that the quantity given at each feeding will depend upon the number of feeds given in the 24 hours, and that if six to five meals at three- to four-hourly intervals be given, as is usual in this country, each individual feed will have to be considerably in excess of the quantities allowed if the same degree of dilution be maintained. It is here that the only practical difficulty in the application of Dr. Bloch's method, at least by unskilled persons, is likely to be met with. In all other respects the scheme appears to have been devised upon thoroughly scientific lines, the aim having been throughout to systematise the artificial feeding of infants in such a way as to eliminate some of the grosser elements of danger, such as those connected with over-feeding and with a sudden transition to stronger dilutions.

THE TUBERCULOSIS NURSE.

THE lot of the tuberculosis or sanatorium nurse has hitherto been hard, and it is to be hoped that the steps recently taken by the Society of Superintendents of Tuberculosis Institutions will secure her better conditions. At present she has, as a sanatorium nurse, no official status; she may have worked for years in a sanatorium under a fully-trained sister, but if the nurse wishes to take up work in a general hospital she must start from the bottom rung, going again through that disciplinary moulding which, however salutary, is not a process the average woman would care to repeat. This is one reason why it is difficult to obtain a good class of probationer in sanatoriums. Another reason is the comparative monotony of sanatorium work. It would be easier to endure if there were a prospect of some official recognition which would give the experienced sanatorium nurse a generally accepted status. Without such official recognition things are bound to go from bad to worse, only ex-patients or women not acceptable to the general hospitals undertaking the nursing in sanatoriums. Matters could hardly be otherwise; sanatorium routine is dull, lacking the vestments, ritual, and aromas which make a sensuous appeal in the operating theatre as elsewhere. The atmosphere of the sanatorium, barren in more than the physical sense, may fail to keep alive interest in its work. These are some of the considerations which have led the Society of Superintendents of Tuberculosis Institutions to formulate a scheme for the training, examining, and certificating of tuberculosis nurses who fulfil certain requirements. Before a certificate is granted, the nurse must have undergone a period of training for two years, or, if she is on the general register of the General Nursing Council, for one year. She must give evidence of special knowledge of tuberculosis as well as general knowledge of nursing, and she must have mastered the elements of anatomy, physiology, and hygiene according to the syllabus of the General Nursing Council. The examination for the Society's certificate will be held in May and November of each year under conditions calculated to make the test severe and the passing of it a guarantee of efficiency. Undoubtedly, every effort will be made by the Society of Superintendents to keep at a high level the standard of their proposed examination, particulars of which will be found in the February number of *Tubercle*. But the fate and value of the proposed certificate will to a certain extent depend on the attitude adopted towards it by influential bodies in the nursing world, and it is to be hoped that, unless they can produce a better scheme, they will help forward a movement intended for the benefit of a hitherto neglected branch of nursing.

THE RESISTANCE OF INSULIN TO HEAT.

REPORTS have come home from India from time to time suggesting that insulin loses its properties when it is kept in a hot climate. This matter formed the subject of a joint letter from two British firms of manufacturing chemists (THE LANCET, Jan. 12th, 1924). In this it was shown that insulin was unaltered by its exposure to the climate of India, and suggested that the erroneous impression was due to the nature of the rabbit which was used to test the strength of the insulin. The *Indian Medical Gazette* for January, 1924, has just reached us, and sets out the evidence on which the statement was made that the insulin had lost its properties. Major J. Taylor and Dr. A. R. J. Douglas first gave the insulin to a patient who had a very high blood-sugar. The dose of insulin varied from 10 to 25 units, and the fall in the blood-sugar was insignificant; but since carbohydrate had been given at the same time it is not surprising that the blood-sugar did not fall much. As the experiments on man seemed unsatisfactory the insulin was tested out on rabbits. Although 50 units were given to a starved rabbit, the blood-sugar did not fall and the animal was quite unaffected, whereas 3 units will send a rabbit into convulsions in England. On this animal evidence it seemed certain that the insulin had lost its potency. But when the British Drug Houses tested insulin which had travelled to and from India it was found that even the insulin in a half-used bottle was still just as potent as it had been when it was first put up. It was therefore suggested that the Indian rabbit was at fault in its response to insulin and that the insulin was unaltered in the hot climate. An editorial note is added to Taylor and Douglas's paper, pointing out that at least one good clinical

report had already been published in India with European insulin. It seems clear therefore that the fear that insulin may deteriorate in hot climates is unfounded, that the error arose partly from the fact that an unsuitable patient was first tested, but mainly because the rabbit in India behaves differently from the rabbit in England. Diabetics who intend travelling to India and other hot climates may rest assured that the insulin will retain its virtues.

THE POPULATION OF SCOTLAND.

THE former volume embodying the result of the thirteenth census enumeration in Scotland was preliminary, giving simply the population figures of the more important administrative divisions of the country. The present volume [1] gives detailed information for these divisions respecting ages of the population, conjugal condition of persons aged 15 and over, orphanhood, birthplaces of the population, Gaelic-speaking population, and housing conditions. The total population of Scotland now approaches 5 millions; its actual increase between 1911 and 1921, owing largely to war conditions, having been only 2·6 per cent., as compared with 6·5 per cent. in the previous decade. Another reason for the lowered rate of increase is the decline of the birth-rate, and this is illustrated also by the increasing average age of the population, which for both sexes was 28·0 in 1911, and had become 29·6 years in 1921. Five full-page charts of age-distribution of the population in 1921 and 1911 show the effect of the war in diminishing the proportion of males aged 20–40 as compared with females and as compared with males at the earlier period. The statistics of orphanhood of all children under 15 have much interest in view of the likelihood of widows' pensions in a not very distant future. Of the nearly 1½ million children under 15 in Scotland in 1921, 88·8 per cent. had both parents alive, the fathers of 7·2 per cent. were dead, and the mothers of 3·2 per cent. were dead, while 0·8 per cent. had both parents dead. The housing statistics are of great importance from a public health standpoint, and we must express our regret that the systems of tabulation of this important section of census results in the English and the Scottish reports are not completely identical, with the result that the path of the social inquirer desiring to make comparisons is rendered unnecessarily difficult.

THE OXFORD UNIVERSITY PRESS.

THE Directors of the Oxford University Press celebrated with an important luncheon party, on Shrove Tuesday, the removal of their London head-quarters to Warwick-square, where the new buildings will be known as Amen House, in reminder of their previous location at Amen Corner. The Oxford University Press has been in existence for some 250 years, its first duty being to supply to the public bibles and prayer-books. This business was first transacted from the University, but late in the eighteenth century a warehouse was opened in Paternoster Row, and the trade was conducted from that centre in the City for a hundred years, at which period—namely, about 1870—the University Press began to take its place in the general publishing trade. At this time Dean Kitchin and Dr. Bartholomew Price, the Master of Pembroke College, Oxford, were in succession secretaries to the University Delegates, the authorities of the Press, and Mr. Henry Frowde was manager of the Bible Warehouse. Kitchin introduced the Clarendon Press books, edited by himself and famous scholars like Skeat and Aldis Wright, and the secular publications, which for a few years had been published for the University by Messrs. Macmillan, were now taken over under Frowde's management. No one needs to be reminded of the high place which the Oxford University Press was now taking in the publishing world at home and abroad, and under the direction of the present publisher, Mr. Humphrey Milford, these activities have been extended in many directions, so that the general catalogue of the Press now contains a description of some 10,000 books, a total which is daily increased.

At the luncheon to celebrate the opening of the new buildings the Chancellor of the University of Oxford, Lord Curzon, presided, and was supported by the Archbishop of Canterbury, Lord Balfour, Mr. Asquith, the Bishop of London, the Bishop of Ripon, and the Vice-Chancellors of Oxford, Cambridge and London, while the guests numbered the heads of the great publishing houses and many leading persons in the literary and scientific world. The speeches were from different aspects fully informative of the great work which has been done by the Oxford University Press throughout its long existence. The Archbishop of Canterbury pointed out that apart from moral influence exercised by the wide publication of the Scriptures, scholars owed a great debt to the University Press for the publication of works that could not in themselves ever be remunerative, while Mr. Asquith, in a serious but cajoling speech, described the successful efforts of the Press as a development of a system of pooling, under which the publication of popular classics, and even of children's books, provided the funds to defray the issue of large works with less public appeal. Lord Curzon, in replying for the Press, was very happy in his humorous presentation of the merits of the University of Oxford over the University of Cambridge, while he signalled out for particular mention as the result of the work of the Oxford Press the new Oxford Dictionary of the English Language, the new edition of Liddell and Scott's Greek Lexicon, and the continuation of the Dictionary of National Biography. He thought that the Archbishop laid undue stress upon the publication of unremunerative or erudite work, and assured Mr. Asquith that the Press would publish lyrics by himself, a romance by the Archbishop, or a detective novel by Lord Balfour. He joined with the proposers of the toast to which he was replying in testimony of the excellent printing and format of the productions of the Press, and to the admirable work done by Mr. Humphrey Milford, the University publisher, and his colleagues. He concluded his speech by proposing the health of Lord Balfour as the ideal Chancellor of the "second ideal university," a challenge which Lord Balfour accepted very happily, by pointing out that the new edition of Liddell and Scott must pay its debt to such Cambridge scholars as Richard Jebb, and that the issue by the Cambridge University Press of famous English poets had provided the best material for the Oxford Dictionary of the English Language.

THE MEDICAL AND DENTAL REGISTERS.

THE Medical and Dental Registers for 1924 reach us on March 4th. The number of names added to the Medical Register during the year 1923 was 2482—far the highest number on record—distributed as follows: England, 975; Scotland, 878; Ireland, 385; Colonial, 238; and Foreign, 6. During the same period 105 names were restored to the Register and 923 names removed; 648 on evidence of death, 1 on ceasing to practise, 270 on non-response to inquiries, and 4 by direction of the Council. The total number of names on the Medical Register on Dec. 31st, 1923, was 48,140. The additional names account for the increased number of pages in the Register itself, the only substantial addition to the preface being the text of the Dentists Act of 1923. The Warning Notice has been shortened by omission of a section dealing specially with dentists, which has now been transferred to the Dentists Register. The Dentists Register contains 13,473 names, being 711 more than last year. During 1923, 1488 names

[1] Census of Scotland, 1921. Report on the Thirteenth Decennial Census of Scotland. Vol. II. H.M. Stationery Office, Edinburgh. 20*s*. 9*d*.

were added by registration and, of these, 614 were registered with British qualifications, and 867 registered under the Dentists Act, 1921. Colonial registrations numbered 6 and Foreign 1. During the same period 484 names were restored to the Register and 1261 removed: 207 on evidence of death, 1 on ceasing to practise, 794 on failure to renew the annual certificate, 255 on non-response to inquiries, and 4 by direction of the Council. Contrary to expectation, the total number of names on the Dentists Register has been far more than kept up. In response to a request from many quarters for a list of dentists practising in various localities, the Dental Board has in preparation a list showing under each town the names of the dentists practising therein. For this year the list will be published separately from the Register at 3*s*. 3*d*., post free. Enclosed in the Dental Register is a pamphlet containing the names of dental companies—that is to say, of bodies corporate carrying on the business of dentistry on Jan. 1st, 1924. At the same time the usual list reaches us of medical and dental students registered during the year 1923, the total number so registered being 545 medical and 107 dental. The figures in each case are for their smallness without parallel since 1888, and in the case of medical students without parallel at all, being less than a third of last year's entry.

The Provisional Committee of the American Hospital in London is now ready to receive patients at their temporary headquarters, Manor House, 47, St. John's Wood Park, N.W. 8, near Marlborough-road Station. The patients are limited to American citizens, American wives of British subjects and their children. Applications for the admission of patients, and all communications relative to the hospital, should be directed to Mr. Philip Franklin, F.R.C.S., Medical Director, 27, Wimpole-street, London, W. 1. (Telephone: Mayfair 868.)

THE following lectures will be delivered at the Royal College of Physicians of London, Pall Mall East, during March and April, at 5 P.M. Lt.-Col. Glen Liston will deliver the Milroy Lectures on March 11th, 13th, 18th on the Plague. The Goulstonian Lectures will be given by Dr. Leonard G. Parsons on March 25th and 27th, and April 1st on some Wasting Disorders of Early Infancy, while the Clinical Features of Foreign Bodies in the Bronchi will be dealt with by Dr. Thomas McCrae in three Lumleian Lectures on April 3rd, 8th, 10th.

THE DOMINIONS HOSPITALITY COMMITTEE.—The Dominions Hospitality Committee, announced last week as in process of formation, is now nearly complete. The purpose of the Committee is to offer welcome and to extend hospitality to all British medical men visiting London during the Empire Exhibition this year. The following have consented to serve on the Committee:—President: Sir William Hale-White (President of the Royal Society of Medicine). Vice-President: Sir Bruce Bruce-Porter (President of the Hunterian Society). Sir Humphry Rolleston (President of the Royal College of Physicians); Mr. H. J. Waring (Vice-Chancellor, University of London; Vice-President of the Royal College of Surgeons); Surgeon Vice-Admiral J. Chambers, R.N. (Medical Director-General, Navy); Maj.-Gen. Sir William Leishman (Director-General, A.M.S.); Air Commodore D. E. Munro (R.A.F.); Mr. C. P. Childe (President of the British Medical Association); Dr. Herbert Spencer (President of the Medical Society of London); Sir William Willcox (President of the West London Medico-Chirurgical Society); Dr. Dudfield (President of the Harveian Society); Dr. Crewdson Thomas (President of the Chelsea Clinical Society); Mr. J. Cunning (President of the Australian and New Zealand Medical Society in England); Mr. Donald Armour (Canada); Dr. H. A. Ellis (Australia); Sir John MacAlister (Secretary, Royal Society of Medicine); Sir Squire Sprigge (Editor of THE LANCET). Hon. Secretaries: Mr. A. E. Mortimer Woolf (Hon. Sec., Hunterian Society); Mr. E. T. Milligan, O.B.E. (Hon. Sec., Australian and New Zealand Society in England). The address of the hon. secretaries for all correspondence is 1, Wimpole-street, London, W. 1.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXI.

THE TREATMENT OF MALARIA AS MET WITH IN ENGLISH PRACTICE.

THERE are three forms of malaria, which, though possessing several cardinal features in common, are caused by three distinct parasites—the benign tertian, the quartan, and the subtertian (sometimes also known as the malignant). The clinical symptoms produced by these three parasites vary very considerably, and it may be said that, though the pathology and treatment of the two first-named varieties are similar, that of the subtertian differs very considerably. The clinical states produced by malaria which may be encountered in English practice are due either to benign or subtertian parasites. It is therefore important to realise that the term "benign" as used in this sense is in many ways a misnomer, for, though not actually dangerous to life itself, the benign parasite may cause considerable disability, and, owing to its proclivity to relapse, it is much less amenable to quinine therapy than is the subtertian.

Diagnosis.

The diagnosis of the main forms of malaria rests upon the detection of the parasite in the blood by means of the microscope. There are certain definite morphological features by which the parasites may be distinguished in stained blood films, but difficulty may be experienced in differentiating the youngest or ring forms of parasite which are found in the blood during the course of a febrile attack.

There is a widespread idea which appears to rest upon inadequate foundations that the parasites of malaria appear in the blood-stream in sufficient numbers to be recognised under the microscope only during the febrile paroxysms, but this is by no means the case. It is true that they are the more readily demonstrable, but they are present also during the apyrexial periods when the immature forms of the parasite can be found, if the films are searched thoroughly by a skilled microscopist. In the physical examination of malaria one may be guided by the anæmia so often associated with the disease, as well as by the splenic enlargement, but neither of these (which are usually considered cardinal signs) may be present. Obvious anæmia may be altogether absent in the pernicious attacks of the subtertian infection which are so dangerous to life, nor may the spleen be palpable. The absence of these two signs should not prevent one from examining the blood, which constitutes the only absolute guide to diagnosis.

The symptoms of benign tertian malaria are generally sufficiently obvious in the acute stage; the fever it evokes is sudden, severe, and of short duration; it is accompanied by the usual phenomena of rigor and sweating, but there are other cases in which a pyrexial attack does not develop; the patient may then experience a transient malaise, slight shiverings, or headache. As a general rule, it is the latency of the benign parasite and its liability to recrudesce at any period—it may be for four years—from the time of the original infection, which renders it such a particularly annoying and disabling disease. Months may pass between particular attacks, but after undue exertion or exposure to cold the patient may be struck down again by fever.

The symptoms of the subtertian infection are entirely different. As a general rule, the clinical symptoms are more insidious in their onset, the attack of longer duration, of less dramatic effect, but considerably more injurious to health. The clinical guises which subtertian malaria may assume are very numerous. It may produce extremely acute pernicious symptoms and death within a very few hours. Again, the symptoms may be mainly nervous in origin,

eventuating in mania, delirium, coma, and even epileptiform convulsions; they may be abdominal—dysenteriform or choleraic. There may be no pyrexia at all, the patient may complain of loss of appetite, nausea, and dyspepsia; yet such an individual is liable at any moment to the onset of a sudden pernici us attack, or, it may be, to the supervention of blackwater fever, which is now recognised as a complication of this form of malaria. The blood of individuals returning from the tropics, whatever their complaint may be, should invariably be examined for the subtertian parasite, and should it be found, the case should be regarded in a serious aspect and the infection as a potential danger to life itself.

Treatment.

There is only one specific drug in the treatment of malaria, and that is quinine. Considerable doubt has been cast upon this question during and since the war, mainly occasioned by the failure of quinine therapy to prevent relapses in the benign tertian infections. No drug is absolutely specific, and any hesitation which may have arisen on this point has its origin in failure to appreciate the limitations of quinine therapy.

As soon as a diagnosis has been arrived at, quinine should be given, and it must be exhibited in such a manner that it can be absorbed, and, moreover, it must be continued over a considerable period of time. Whenever possible quinine should be given by the mouth, and only in cases of persistent vomiting or in the severe or pernicious forms of the disease should the drug be injected.

Benign Tertian.—As soon as the patient commences to perspire quinine should be given in solution in 10 gr. doses three times a day after food. The sulphate and the hydrochloride are the two salts of quinine most frequently prescribed, the latter, being more soluble, is preferable. It may be given as follows:

Quinine hydrochlor.	gr. x.
Acid. hydrobrom. dil.	℥ ii.
Syr. aurant.	drm. i.
Aq. chloroformi	ad ½ oz.

The addition of the hydrobromic acid is designed to assist in the solution of the quinine, and has the reputation of preventing the disagreeable tinnitus which results from the absorption of the drug. In the case of an adult this dosage of quinine should be persisted in for the next week and in all probability the succeeding attacks will be thereby prevented, but thereafter, with a view to preventing the recurrence of fever, the patient should persist in quinine therapy for some considerable time. It is usual to reduce the quinine to 20 gr. a day in the second week, and subsequently to 10 gr. a day for the next two and a half months; this is what is generally termed anti-relapse treatment. The only sound method hitherto devised to effect this purpose is the regular and constant exhibition of small doses of quinine over a long period. Should this be neglected the parasite will most certainly recrudesce and numerous relapses result.

Quinine sulphate in pill form as a means of curing malaria or preventing relapses should be avoided. Quinine is only readily absorbed when the intestinal tract is in a healthy condition, therefore it is necessary that the patient should take a mild saline such as sod. sulph. oz. i. once or twice a week while on quinine therapy.

As adjuvant to quinine in the acute fever the following diaphoretic mixture may be given:—

Liq. ammon. acet.	drm. ii.
Spir. æther. nitros.	℥ xxx.
Aq. camph. co.	ad ½ oz.

Arsenic has the reputation of acting as an adjuvant to quinine, and at the same time it assists in combating the anæmia. It is customary, therefore, to prescribe the following mixture to be taken in addition to the quinine, to be taken twice daily:—

Acid. sol. arsenic.	℥ iii.
Ferrous sulph.	gr. ii.
Acid. hydrochlor. dil.	℥ iii.
Aq. ad	½ oz.

There are many preparations of quinine, the most insoluble, such as euquinine and quinine tannate, are tasteless, so their value in the treatment of the disease is doubtful. Cinchona febrifuge, a preparation much used in India, contains the additional alkaloids of cinchona bark, and is given in the same doses as quinine and acts much in the same manner. Esanofele, a proprietary drug much used at present, contains quinine bisulphate and arsenious acid. To some people the bitter taste of quinine is intolerable; to such the hydrochloride may be given in powder form in cachets, or the patient may be directed to drink milk or chew bread immediately after the dose of quinine, both of which methods assist in removing the obnoxious taste.

Salvarsan and its derivatives are considered by some authorities to exert a parasiticidal effect in malaria; it is extremely doubtful whether this is true. Undoubtedly, when used in combination with quinine and given in small doses (0·3 g.) as intravenous injections once or twice a week, they exert a distinct stimulating effect and are thereby useful in the anti-relapse treatment of the benign tertian infection.

Subtertian.—The treatment of cases of average severity is on the same lines as that already described. The patients are usually men who have recently returned, apparently in good health, from the West Coast of Africa or other endemic focus of this infection, who may give no history of fever whatsoever, but in whom suggestive symptoms may appear on arrival in England. The subtertian parasite responds quickly to quinine treatment, and as a rule does not relapse; on the whole, therefore, the treatment of this form is much the more satisfactory.

Should the parasites be very numerous in the blood-stream and the clinical symptoms of the patient very severe, quinine should be injected intramuscularly. For this purpose the bi-hydrochloride salt is chosen. It should be injected in solution deep into the substance of the gluteus maximus in 7 to 10 gr. doses. As a general rule, one or two injections are sufficient; more numerous ones, or those containing larger doses of quinine, are much to be deprecated. Quinine is a tissue poison and may cause extensive necrosis, and, moreover, the danger of "blackwater fever" supervening must not be overlooked, for there is a certain amount of evidence for the view that an injection of quinine may precipitate a hæmolysis of the blood cells and thereby bring about hæmoglobinuria. Intravenous injections of quinine are rarely necessary, save in the comatose or cerebral types. In this case 10 gr. of quinine bi-hydrochloride should be injected intravenously in 10 c.cm. of distilled water by means of a record syringe.

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Recent articles in this series are:—

XXXVI. Menorrhagia in Young Women without Gross Lesion, by Dr. J. S. Fairbairn. XXXVII. Chronic Arthritis, by Dr. W. H. Wynn. XXXVIII. Glycosuria in Pregnancy, by Dr. G. Graham. XXXIX. Flat-foot, by Mr. Blundell Bankart. XL. Medical Treatment of Early or Suspected Duodenal Ulcer, by Dr. J. A. Ryle. XLI. Retention of Urine, by Mr. J. Swift Joly. XLII. Treatment of the Neurotic, by Dr. Kinnier Wilson. XLIII. Blepharitis and Styes, by Mr. Affleck Greeves. XLIV. Internal Derangement of the Knee-joint, by Mr. R. C. Elmslie. XLV. Cœliac Disease, by Dr. R. Miller. XLVI. Varicose Veins, by Mr. Philip Turner. XLVII. Colles's Fracture, by Mr. Harry Platt. XLVIII. Pyelitis, by Sir J. Thomson-Walker. XLIX. Prolapse, by Mr. Beckwith Whitehouse. L. Epistaxis, by Mr. J. Gay French. LI. Chronic Colitis, by Dr. Adolphe Abrahams. LII. Toothache, by Mr. A. T. Pitts. LIII. and LIV. The Acute Mental Case, by Dr. H. Yellowlees. LV. Acute Obstruction due to Growths of the Colon, by Mr. H. W. Wilson. LVI. Squint in Young Children, by Mr. T. Harrison Butler. LVII. Acute Septic Infection: Septicæmia, by Dr. A. E. Gow. LVIII. Surgical Treatment of Hæmatemesis, by Mr. A. J. Walton. LIX. and LX. Nephritis, by Prof. Hugh MacLean.

Medicine and the Law.

HARNETT v. BOND AND ADAM.

AFTER a trial lasting 16 days before Mr. Justice Lush, a special jury found answers to a series of questions and awarded damages in an action brought by Mr. W. S. Harnett against Dr. C. H. Bond, a Commissioner in Lunacy, and Dr. G. H. Adam, manager of a home for the reception of insane persons at Malling Place, Kent. Damages were claimed on the ground of the alleged wrongful detention of Mr. Harnett as a lunatic. In 1912 he had been an inmate of Dr. Adam's asylum for a few weeks, and on Dec. 12th was allowed to leave it on probation for 28 days. Two days later he went to the office of the Board of Control, where he had an interview with Dr. Bond, who, after conversation with him, detained him and communicated with Dr. Adam by telephone. As a consequence Mr. Harnett was taken back that afternoon to Malling Place in a motor-car by two attendants sent for him by Dr. Adam, after which he was kept there and in other asylums till Oct. 15th, 1921, on which date he escaped, and was afterwards certified as sane by the mental specialists whom he consulted.

A summary of the evidence, speeches, and summing-up follows; the findings of the jury at the conclusion are given here in order that the precise issues raised by the specific points submitted to them may be appreciated.

1. Did Dr. Bond cause the plaintiff to be detained at the office until the attendants came for him?—Yes.

2. Did he cause him to be sent back for the purpose only of his being examined by Dr. Adam or for the purpose of his being detained at Malling Place?—Being detained at Malling Place.

3. Did Dr. Bond cause the plaintiff to be taken back?—Yes.

Did he and Dr. Adam agree, after consultation, that the plaintiff should be sent for and taken back?—No.

Was the taking back entirely the act of Dr. Adam?—No.

4. Was the plaintiff of unsound mind on Dec. 14th, 1912?—No.

Was he fit to be at large?—Yes.

Was he dangerous to himself or to others?—No.

5. Did Dr. Bond honestly believe that the plaintiff was of unsound mind, not fit to be at large, and dangerous to others?—No.

6. Did he believe that the plaintiff had escaped from his brother's charge; and, if so, was that his reason for having him sent back?—Yes.

7. Did he take reasonable care to ascertain the true facts?—No.

8. Did he honestly believe that Dr. Adam had retained the power of retaking the plaintiff back during his 28 days' leave of absence?—Yes.

9. Did Dr. Adam, when he received the telephone message and sent his car, honestly believe that the plaintiff, on Dec. 14th, 1912, was of unsound mind and unfit to be at large?—Yes.

10. Did he honestly believe that it was in the plaintiff's interest that he should be taken back to Malling Place?—Yes.

11. Did he take reasonable care in doing what he did?—No.

12. Did he make it known to the plaintiff that he was liable to be taken if his mental condition required it?—No.

13. Was the detention of the plaintiff at the Commissioners' Office the act of Dr. Bond alone, or was it really the act of both defendants?—Dr. Bond.

The jury assessed the damages at £25,000, apportioned as follows: £17,500 against Dr. Bond, £7500 against Dr. Adam, subject to reduction if it were held that there was responsibility only for the plaintiff's detention by Dr. Adam, to £10,000 (Dr. Bond £7500, Dr. Adam £2500), and alternatively £5000 against Dr. Bond in respect of the detention of the plaintiff at the offices of the Commissioners in Lunacy. The judgment given two days later after argument by counsel will be found below.

Mr. J. B. Matthews, K.C., opening the case for the plaintiff, declared that there was no right whatever on the part of Dr. Bond, any more than there was for any citizen, to detain anyone or give him into custody as a lunatic. The plaintiff had originally been put under restraint upon certificates given by Dr. H. Fisher and Dr. Penfold (since dead) under a reception order signed by a justice of the peace, and an action was pending against Dr. Fisher. The grounds for the first certificate were detailed by counsel. Mr. Harnett, after the death of his first wife in 1908, had believed himself infected with nasal catarrh through germs contracted from her, and an unqualified person had treated him with injections of tuberculin. As a result he had suffered from fever and delirium, and in October, 1912, had been under the care of male nurses. On Nov. 10th he was certified and received at Malling Place. He was certified as deeply steeped in sex problems, but, said counsel, many people, especially since the war, had taken an interest in sex problems and discussed them openly as they would not have done before. The plaintiff had thought that the young should be instructed in sex matters and had issued a pamphlet dealing with the subject.

Mr. Harnett then gave evidence and described having waited from morning to afternoon at the offices of the Board of Control under the impression that his affairs were being looked into, and said that he had been hindered by a clerk when he wanted to go out to luncheon, and was removed at 2.30 P.M. on Dec. 14th. Further, he complained of rigorous treatment at the asylum. He said that he had escaped from an asylum at Aylsham, Norfolk, after complaining without effect to the Lord Chancellor. A number of letters were read addressed by the plaintiff to the Lord Chancellor and to the Commissioners complaining bitterly of his confinement and of his treatment, and the plaintiff, continuing his evidence, said that he had been kicked and struck by a lunatic, that he had complained to a visitor and been threatened by Dr. Adam for doing so. In cross-examination, he said that since Oct. 31st, 1912, he had been perfectly sane. He had never seen any vision or heard supernatural voices since seeing his mother's spirit in 1896. In November, 1912, when ill, he had said, "You people think I am mad." "They did not answer, and I said, 'Spell parallelogram.' They still did not answer and I spelt it correctly." He suggested that his wife and Dr. Penfold had persuaded his brother to have him confined.

Mr. E. Hambrook, a farmer, Mr. A. A. Norman, a solicitor, Mrs. M. A. Girdlestone, a relative, Mr. E. Field, who had attended the plaintiff as a dentist, and the Rev. J. W. Jones, who had been in contact with Mr. Harnett before and during his detention in mental homes, were of the opinion that when they saw him he was sane. Dr. H. J. Bryan was consulted by the plaintiff on Dec. 13th, 1912, and only found him "talkative." Dr. J. S. Risien Russell had examined the plaintiff in November, 1921, and certified him as sane. He considered that his re-arrest and sending back to the home was calculated to have a detrimental effect. Dr. A. C. Morton, instructed by the Commissioners, had visited Mr. Harnett in the mental home at Aylsham and became friendly with him. In June, 1921, he had told a Commissioner that if the plaintiff were at liberty he should not certify him. He admitted, in cross-examination by the Attorney-General for Dr. Bond, that he had reported of the plaintiff that he was talkative and excitable, had some religious mania, and seemed under the impression that he was being persecuted. This was in May and June, 1921. He was then on the border line with regard to religious mania, but the witness could not recall what his delusions were. Dr. T. Hyslop examined Mr. Harnett in November, 1921, and found him capable of managing his affairs.

At the close of the plaintiff's case it was submitted that there was no case for damages, that the only case against Dr. Bond arose out of the detention at the Commissioners' Office, and that Dr. Adam in the circumstances could not have acted otherwise, but the judge held that the trial must go on, and said that there was a prima facie case that Dr. Adam had had

the plaintiff brought back without first satisfying himself that he ought not to be at large.

The Attorney-General, Sir Patrick Hastings, K.C., opening the case for Dr. Bond, referred to the difficulty of devising any means by which more complete protection could be given to any individual detained as insane than had been afforded to Mr. Harnett. But he admitted that after the evidence heard that day there were grave doubts whether any satisfactory method could be adopted to ensure that no person hereafter should remain in an asylum without independent investigation. The Attorney-General suggested as the best protection the visits at stated intervals of an independent doctor at the instance of the alleged lunatic or of his friends. He did not say that the plaintiff had not now recovered, but in 1912 he was undoubtedly insane.

Mr. Neilson, K.C., opened the case for Dr. Adam, who, he said, had received the plaintiff when his actions appeared to be entirely uncontrolled. The plaintiff's mother, he added, was insane.

Dr. Bond described the visit of the plaintiff to the offices of the Board and his own interview with him. He had not been able to find out the object of the plaintiff's visit. Mr. Harnett had talked incoherently in broken sentences, and flourished a bag of money which, he said, he had obtained from his bank. After half an hour he formed the opinion that Mr. Harnett was insane and not fit to be about alone, and had told Dr. Adam so by telephone. In cross-examination Dr. Bond was asked with regard to the flourishing of a bag of money, "What more natural or more joyous than that a man should jingle golden sovereigns in a bag?" and his Lordship asked, "You would not call that a proof of insanity?" To which Dr. Bond replied that he should expect a man to keep his money in his pocket. He did not say that Mr. Harnett had not now recovered. He had not examined the plaintiff, who had given his evidence coherently and sensibly, as to his mental state.

Mr. B. R. Dickson, a land agent, Mr. W. Hyder, a solicitor's clerk, and Mr. C. M. Moir, a reporter, gave evidence as to the plaintiff's interviews with them, and as to such acts as grovelling on the floor, asking Mr. Hyder whether he could spell "parallelogram," and describing visions that he claimed to have seen. To the last-named Mr. Harnett had attributed his condition to an overdose of a vaccine. [These witnesses referred to dates before Nov. 10th, 1912, at which date, Mr. Matthews admitted, the plaintiff was rightly certified.]

Mr. A. Harnett, plaintiff's brother, also spoke to his conduct in that period; he had not visited the plaintiff in confinement, having heard that the plaintiff had threatened revenge against him for putting him under restraint. The plaintiff had said he would spend his last penny in punishing all those who had taken part in putting him away.

Dr. Adam stated that he had joined his father in managing the mental home at Malling Place in 1907, and since his father's death in 1908 had managed it alone. He had received Mr. Harnett on his certification and then thought him maniacal, but had sent him out when his condition improved on an order in the usual form with a proviso for power to take him back should his condition require it. In February, 1913, after his return, he had reported to the Commissioners that the patient was not suicidal but inclined to be dangerous and likely to elude a single attendant. Cross-examined as to various acts of the plaintiff and in each case as to whether the act indicated or proved insanity, the witness answered in the negative, with qualifications, saying that all the facts taken together would be evidence of insanity. The acts referred to included addressing friends and neighbours, asking them to testify to his sanity, claiming a mission to go out and "save souls," asking the Governor of Borstal Prison for leave to address the prisoners, writing a letter to "Dear Postal Official" beginning "Jesus has touched my eyes," and talking incoherently and ramblingly on religious subjects. Mr. Matthews, with regard to the way the plaintiff talked, said, "Everyone from preachers to race-course touts raises his voice to emphasise what he says." The witness answered, "He was shouting, and, in my opinion, was suffering from mania." The witness had reported him later to be "Mentally improved, the acute attack of religious mania having passed off"; the condition then was that religious symptoms remained and "his mind was more or less monopolised by religion." He considered that if the plaintiff believed he had a tuberculous throat after he had been told by a specialist that he had not, that would be a delusion, while he had added that he also thought he had cancer of the throat. He had expressed a desire to go and live with Lord Wolseley. It was suggested by counsel that the plaintiff said: "I should like to see Lord Wolseley to shake hands with him and say 'Lord Wolseley, your sword is untarnished.'" The witness did not remember this, but admitted that an explanation might be found in both the plaintiff and Lord Wolseley believing in the efficacy of prayer.

Dr. H. Fisher gave evidence as to having seen the plaintiff on Nov. 9th, 1912, and having certified him as of unsound mind. Cross-examined as to the symptoms connected with religion, and having said that the people living with the patient were not the best judges of his state, he was asked, "So it is the doctor who is to be the ultimate judge," and replied, "I am afraid we are often drawn into this kind of thing against our will." The plaintiff's actions most certainly indicated insanity. Asked by the judge what made a man a lunatic, he answered, "Laying undue emphasis on circumstances which in ordinary life would be of no moment." The offer to preach to Borstal prisoners should be taken in conjunction with other matters. The required examination of a patient did not necessarily involve asking questions, the word used being "observe." He had gone to the examination with a perfectly open mind.

A former head attendant at Malling Place described bringing the plaintiff back from the offices of the Board, and said that he then appeared worse than when he left. He had not been treated badly or threatened.

Dr. T. Claye Shaw, visiting physician at Malling Place, deposed to having had an interview with Mr. Harnett there on Nov. 19th, 1912, and having had no doubt of his insanity, and as to a delusion with regard to a plot against him. He said that excitement in relation to insanity was a question of the degree of excitement shown. He was cross-examined generally as to his experience of the correctness of certification in other cases within his experience.

Dr. Ludford Cooper had been called in by Dr. Penfold to see the plaintiff in October, 1912. While the plaintiff was out on probation in December, 1912, he had found him outside his house and had asked him into his consulting-room. Arrived there, Mr. Harnett had at once fallen on his knees and prayed aloud, following him across the room still kneeling. Beyond the words "Jesus Christ" he was incoherent, and afterwards got up and talked about a plot. The witness had no doubt that he was insane. He had communicated with Mr. Harnett's solicitor and with Dr. Penfold. Later he had met the plaintiff at Malling Place when visiting another patient and Mr. Harnett had shaken him cordially by the hand and asked him "How do you spell parallelogram?"

At this point Dr. Fisher was recalled and was shown a receipt which he acknowledged had been given by him for fees for attendance on Mrs. Harnett, the plaintiff's wife. He had made a statement under cross-examination to the effect that if Mr. Harnett had said that he (the witness) had ever attended Mrs. Harnett, he would have treated it as a delusion. He now withdrew that statement, and was severely censured by the judge, who characterised the evidence as given to help in establishing the plaintiff's insanity.

Dr. Cooper, further cross-examined, said that the plaintiff had referred to something of a painful and delicate nature affecting his wife, and might have suggested that that was the reason for his being put away. He might have dropped on his knees and in

that position related what was on his mind. The Attorney-General offered to go into the matter affecting Mrs. Harnett by calling her as a witness. He was chiefly concerned with the state of the plaintiff's mind in December, 1912.

His Lordship said that he should ask the jury whether the plaintiff was insane on Dec. 14th.

Dr. A. I. Webster said that on Dec. 13th, 1912, Mr. Harnett, to whom he had never spoken before, called on him, and said excitedly, "Dr. Webster, you are a deeply religious man; you believe in the Lord Jesus Christ." He knew of no reason for this, and considered the plaintiff to be of unsound mind. In cross-examination he admitted having read the lessons in church, of which the plaintiff might be aware. He knew that the plaintiff had been in an asylum.

Mr. O. Dickinson, secretary to the Commissioners in Lunacy, gave an account of the visit of the plaintiff to the Commissioners' offices on Dec. 14th, 1912. He looked wild, seemed excited, and was very talkative. The witness described the removal of the plaintiff. There was no reference to the plaintiff's condition in the memorandum made of the visit, but it was mentioned that he had escaped from his brother's charge. He told the judge, in reply to a question, that he could not account for this. His Lordship said, "I attach the very greatest importance to it."

Dr. E. S. Pasmore said that in 1913 he was medical superintendent at Croydon Mental Hospital, and in February of that year fetched the plaintiff from Malling Place. On the way to Croydon Mr. Harnett, in reply to questions, said he had been poisoned with tuberculin and it went to his head. He voluntarily said that he had a mission to save souls and had supernatural power, but he had been prevented from trying to save Wesleyans' souls and had tried to save souls of those condemned at Borstal. He pooh-poohed the suggestion that boys at Borstal were not condemned to death. He expectorated and explained that this was to rid his system of acid injected into it. Cross-examined, Dr. Pasmore said that in 1913 he reported that the patient suffered from "mental exaltation," and his offering to preach at a Wesleyan Church tended to confirm this, as he was not a Wesleyan. In 1914 he appeared to be threatening violence against those responsible for his detention. The witness denied that to develop homicidal tendencies after two years necessarily pointed to chronic permanent lunacy. The symptoms he referred to had nearly passed away in 1917 when he advised that the plaintiff should stay as a private patient in a doctor's house. The witness thought it true that the plaintiff had offered the Commissioners £30 to send a mental detective to his home, to see that he had fair play, but he had not been able to get from him a statement as to the nature of the foul play he suspected.

Dr. H. M. Berncastle, assistant to Dr. Pasmore, described a conversation with Mr. Harnett at the Croydon Mental Hospital, and said that he claimed a mission to save souls, and the possession of supernatural powers. The plaintiff had resented the witness questioning him. He did not seem to realise that when released from Malling Place in December, 1912, he had been let out on trial, but perhaps explanations now given might have put this in a rather different light. He understood him to threaten violence, not legal proceedings. He had heard him give evidence, and should not even now certify him as of sound mind without making a special personal examination.

Lord Sandhurst described interviews with the plaintiff in July, 1913, May, 1917, March, 1920, and June or July, 1921. At the first, lasting three-quarters of an hour, he had formed the opinion that he was in a state of mental exaltation. Mr. Harnett had attributed his illness to the administration to him of a toxin. He had described graphically his religious attitude. He had not thought it desirable that the plaintiff should manage his own affairs, having made this visit for the information of the Master in Lunacy as to the appointment of a receiver. With regard to a later visit, the witness said that he was not there to inquire into the state of the plaintiff's mind with a view to his release. In 1917 he appeared more composed than in 1913, better still in 1920, and there seemed nothing wrong with him in 1921. Hostility to his wife, apparent in 1920, had disappeared in 1921.

Sir James Crichton-Browne gave evidence as to an interview with the plaintiff at Croydon in his capacity of Visitor in Lunacy in 1913. This was at the plaintiff's request after the visit of Lord Sandhurst in July of that year. Dr. Pasmore was out and the witness had formed an entirely independent opinion, without seeing the original certificates. He was with the plaintiff for three-quarters of an hour and satisfied himself without any doubt that he was of unsound mind and dangerous. He had not seen him before or since. The plaintiff was intelligent and had a good memory at the beginning of the interview, and said that he had been infected with nasal catarrh by his first wife after she had been dead three or four years, and that he had been injected with tuberculin by a tailor. He had received a mission from God to preach to sinners. He had a special mission to preach to boys and girls upon matters relating to sex. Asked whether he meant this as to girls, he said "Yes," and that God had prepared him. He was talkative and voluble and became excited.

The witness was proceeding to give statements of the plaintiff concerning his wife, but counsel on both sides wished to exclude this topic, and Sir James Crichton-Browne, having stated that Mr. Harnett had spoken of a "horrible discovery" a month after marriage, said that he formed the opinion that the whole thing was a delusion. The plaintiff had become very excited about it, beating his head with his hands and sobbing. Without the statement in question he should have considered him insane. Mr. Harnett had declared his belief in a plot of which Dr. Adam was the central figure to shut him up and prevent him carrying out his mission. The injection with "tuberculin" by a quack was, in the opinion of the witness, probably an injection with coloured water. Tuberculin would not produce delirium, and he had regarded the supposed result of the injection as a delusion of the patient.

The plaintiff, recalled, said that his offer to preach at Borstal was inspired by the words, "I was in prison and ye came unto Me." He had believed that Dr. Penfold did not believe in God and had therefore asked Dr. Webster whether he did, wishing to be attended by him. He spoke of interviews with Dr. Cooper and of Dr. Cooper having told him that he was perfectly sane. He denied asking him to spell parallelogram. He gave an account of his interview with Dr. Cooper on Dec. 13th, 1912, and said he had told him the same story of his wife that he had told Sir J. Crichton-Browne. He denied kneeling on the floor, but when Dr. Cooper had walked to the fire-place he had knelt on what looked like a *prie-dieu*. He had not claimed supernatural power or that he was overshadowed by God; and Dr. Cooper's description of what occurred was "absolutely false."

The Attorney-General, for Dr. Bond, said that no doubt matters described as the plaintiff's delusions had been in some cases not delusions at all. It was practically impossible always to avoid this occurring. He did not contend that Mr. Harnett was insane at the end of his confinement, but asked the jury to consider whether the plaintiff was out of his mind on Dec. 14th, 1912. Did Dr. Bond honestly think him so? Was he reasonable in forming that opinion? Mr. Harnett was sent back to Malling Place in order that Dr. Adam might judge whether he was better or worse. If he was sane it was not Dr. Bond who was responsible for keeping him under restraint. The only trespass Dr. Bond might have committed was in detaining him at the Commissioners' offices.

Mr. Neilson, for Dr. Adam, submitted that after the reception order and in all the circumstances, Dr. Adam had acted honestly, reasonably, and properly, and done nothing that a properly minded man should not have done in the circumstances.

Mr. Justice Lush, summing up, said that the main point to consider was the plaintiff's mental condition when he went to the offices of the Commissioners in

Lunacy. He was then entitled to have his legal rights observed and the defendants must take the consequences if they had interfered with them without just cause. Dr. Bond had no more control over the plaintiff's personal rights then he (the judge) had. Dr. Adam, if he had disregarded the plaintiff's rights contrary to the law, must take the consequences. What could be more tragic than that if the plaintiff was sane (and he was admittedly a good business man) he should be taken off by keepers and confined with maniacs for nine long years in asylums? He referred to Lord Sandhurst's evidence in spite of which a doctor, a Commissioner in Lunacy, had reported the plaintiff as insane in 1921. His Lordship quoted from a version of the Mikado as to the spelling of parallelogram and said that he saw nothing remarkable in the plaintiff asking people to spell it. If the jury believed that what had been described as delusions were not delusions, and that the doctors had made a terrible mistake, and had kept the plaintiff in asylums when he was sane and able to express himself, it greatly helped the plaintiff's case. His condition during those years was a vital point, as it threw light on his condition in Dec. 14th, 1912. If he then had no delusions what was there to justify his detention?

His Lordship left to the jury the questions given above, and after their answers and their verdict as to damages had been returned heard argument mainly as to the apportionment of the damages.

Mr. Neilson also submitted that Dr. Adam was legally protected by Section 330 of the Lunacy Act, 1890, if he had acted with good faith and reasonable care. He referred to Shackleton *v.* Swift, 2 K.B., at page 316. His Lordship said that Dr. Adam should have seen the plaintiff before taking him back. Mr. Neilson referred further to Section 55 of the Act, which, he argued gave the visiting justices power to grant the order which they did in this case. A proviso enabled the manager to take the patient back. Mr. Neilson also referred to the answers to questions 9, 10, 11, arguing that answer 11 was inconsistent with answers 9 and 10. If Dr. Adam honestly believed that the plaintiff was unfit to be at large, he could not be held to have failed to exercise reasonable care in having him brought back to Malling Place. When he was brought back he was examined and retained there and the jury had not found that Dr. Adam had not been actuated by an honest belief. He asked for judgment on his behalf.

His Lordship in his judgment dealt at length with the various dates as to which the damages might be apportioned, and proceeded to the question of remoteness of damage, the point being whether the defendants by their acts and through the findings of the jury were liable to pay damages in respect of the whole period of the plaintiff's detention as insane—that is to say, from Dec. 14th, 1912, to Oct. 15th, 1921, when he escaped. It was contended that the damages were too remote if assessed for the whole period of detention, and that the chain of causation was broken by a *novus actus interveniens* when Dr. Adam found the plaintiff to be insane on his return to Malling Place, or when in February, 1913, he was removed to Croydon, or when in November, 1913, he was re-certified. In his Lordship's opinion there was no *novus actus interveniens*, and it was therefore quite open to the jury to treat the long detention as a direct consequence of the defendant's acts. He expressed the view that each fresh medical superintendent receiving a patient under his care would know his history as shown by previous reports, and would take these into account so that decisions by different doctors, commissioners, visitors, and medical superintendents were not fresh interventions breaking the chain of causation. The jury evidently thought the plaintiff was sane throughout the whole time. The alleged delusions were disposed of and the Attorney-General did not dispute that most of them were not delusions. As to Dr. Adam, he could and should have seen the plaintiff first instead of allowing him to be detained and fetched back. He was guilty of gross want of care in acting as he did. He had submitted the plaintiff to the shock of being brought back before he examined him. As to Dr. Bond, the jury had found that the plaintiff was not of unsound mind on Dec. 14th, 1912, and that Dr. Bond did not honestly believe that he was (Q. 5). They had found that Dr. Bond had formed a mistaken view (Q. 6). If Dr. Adam had ascertained the truth he might not have had to see the plaintiff at all or if he had gone he might have cleared the matter up. There was, in his Lordship's opinion, ample evidence to support the jury's findings. Under Section 330 of the Lunacy Act, 1890, he held that the onus of proof that an official exercised reasonable care was on the official. His Lordship gave judgment for £5000 against Dr. Bond personally, and for £20,000 jointly against him and Dr. Adam, with costs to follow the event. On the question of a stay of execution being raised, he ordered £5000 to be paid by Dr. Bond within a week to the plaintiff, and £20,000 to be paid into court or security given within three weeks, with an undertaking as to costs.

The case lasted altogether 18 days, commencing Feb. 6th and ending Feb. 29th.

Public Health Services.

THE LOCK-UP SURGERY IN INSURANCE PRACTICE.

IT is laid down in the terms of service (Clause 12) under the National Insurance Acts that the panel practitioner may not carry out his insurance practice elsewhere than at his place of residence, except under such conditions as appear to the Insurance Committee, or, on appeal, to the Ministry, to be compatible with efficient service. Under these terms a lock-up surgery may be conducted if the doctor has made suitable arrangements whereby he may be available to his panel patients at any time his attendance may be required. At a recent meeting of the London Insurance Committee the question of what constituted suitable arrangements was brought up in a report of the Medical Benefit Subcommittee, of which a section consisting of three representatives of the Insurance Committee, and an equal number from the Panel Committee, had been appointed to deal with this matter. The section considered all cases of insurance practitioners who do not reside at their respective surgeries, with a view to satisfying themselves as to the arrangements made. While under the terms of service the practitioner is required to notify his patients at his own expense of any special arrangements which he may make in carrying out his insurance duties, the regulations under the Act do not specify any details with regard to such arrangements, and the Insurance Committee have agreed with the Ministry that in urban areas arrangements such as the following might be reasonably considered adequate in the conduct of a lock-up surgery:—

1. That there be a resident caretaker in the surgery and that telephonic communication should be established between the surgery and the doctor's residence.
2. Where the doctor lives within the distance limited in accordance with the decision of the Insurance Committee of the area, the doctor's address should be posted up at the surgery where it shall be visible both by day and by night.
3. Where the doctor lives at a distance and only his deputy is available between certain hours, a written notice of the deputising arrangement should be given to each of the doctor's patients.

Every case is to be considered on its merits by the Insurance Committee after consultation with the Panel Committee, and the Insurance Committee may require that the patients are to be notified at the practitioner's expense of any special arrangements under which the practice is carried on.

A PROMPT SCHOOL MEDICAL REPORT.

THE first annual report of the school medical service to reach us for the year ending Dec. 31st, 1923, comes from Taunton. The chief feature of the year's work was the opening of a new clinic where minor ailments, defective vision, discharging ears, skin disease, and dental defects are treated. The clinic is to be a health centre where advice as well as treatment can be obtained. Parents are invited to bring any child they are anxious about to the centre for examination, between 9 and 10 A.M. No card is required for admission, and attendance is counted as school attendance. School inspection treatment, feeding, infant welfare work, in fact all public health activities are administered through one officer, Dr. John Allen. The school nurse is also school attendance officer—a successful combination in Taunton. The child is looked after by the health department from the cradle until he finds employment after school, except during the critical period between 3 and 5 years of age. And no doubt Dr. Allen will shortly find some means of bridging this ugly gap. The routine inspection of 1250 children revealed 229 requiring treatment, and in 88·6 per cent. of these cases it was obtained. The dental examination of 1804 children resulted in treatment for 1061 of the 1258 cases requiring it. Throughout the year, with the exception of the summer holidays, dinners were provided by the Education Committee. The average daily attendance was 52. A one-course meal, with, in addition, a daily allowance of 2 oz. of wholemeal bread, and twice a week uncooked fruit such as apples or oranges, was served. The cost was 1·7*d*. per child for food, and for administration 2·8*d*. All the administrative part of this work was dealt with by the medical department. Unfortunately, all the infant departments in Taunton were closed for two weeks in April on account of measles and whooping-cough. Altogether during the year there were 39 cases of measles and 62 of whooping-cough.

The Services.

ROYAL ARMY MEDICAL CORPS.

Col. J. Poe, late R.A.M.C., retires on ret. pay.

Capt. T. Young to be temp. Maj. whilst empld. as Dep. Asst. Dir. of Hygiene.

Capt. K. N. Purkis retires, receiving a gratuity.

TERRITORIAL ARMY.

Maj. (Prov.) A. S. Bruzaud, having attained the age limit, is retired and retains the rank of Capt.

Capt. J. B. Orr to be Bt. Maj.

Maj. D. V. Haig, having attained the age limit, is retired and retains the rank of Maj. with permission to wear the prescribed uniform.

Capts. F. S. Fletcher and J. L. Lawry, having attained the age limit, are retired and retain the rank of Capts.

Capt. (Prov.) J. G. B. Coleman, having attained the age limit, is retired and retains the rank of Lt.

Capt. C. D. Mathias to be Maj.

Capt. R. J. W. A. Cushing resigns his commn. and retains the rank of Capt.

Lt. J. S. Pegum resigns his commn. and retains the rank of Lt.

ROYAL AIR FORCE.

Capt. C. T. Hastings, Army Dental Corps, is granted a temp. commn. as a Flight Lt. on attachment for duty with the R.A.F.

DEATHS IN THE SERVICES.

Inspector-General Walter Reid, R.N. (retd.), who died at Okehampton on Feb. 27th in his eighty-fourth year, graduated M.D. at Edinburgh University in 1863, in which year he also obtained the L.R.C.S. Edin. He then joined the Royal Navy and saw service in the Ashanti War of 1874, when he was mentioned in despatches and received the medal. Among his contributions to medical literature was a case of Double Popliteal Aneurysm at Haslar, which appeared in THE LANCET in 1895. He retired with the rank of Inspector-General in 1898.

Correspondence.

"Audi alteram partem."

MEDICAL MEN, THE LAW, AND THE PUBLIC.

To the Editor of THE LANCET.

SIR,—Modifications in the relations between medical practitioners, the law, and the public, especially the section of it suffering from mental disorder, are evidently called for. On the one hand, there is a public, jealous that no one shall be deprived of his liberty on account of mental ill-health except for reasons which appeal even to the uninformed—i.e., that the patient should be the raving lunatic of popular imagination or the wild-eyed homicidal maniac lusting for blood—and but little realising that under a calm exterior there may lurk a state of mental disorder rendering the individual utterly incapable of looking after himself or of being anything but a source of misery, and possibly of danger, to those about him. On the other hand, there is our profession, regarding the individual as a patient to be cared for, treated, and kept from harming himself and others. We are loaded with the always disagreeable, frequently odious, and not infrequently dangerous responsibility of "certifying" the patient; with the uphill and wearing burden of endeavouring to ameliorate the mental state of our patients and of safely and comfortably housing them; and with the solution of the problem of returning patients to normal society only when we feel sure that they are fit for it, and if they are not quite well, of securing that they shall be, with advantages to themselves, properly and safely looked after.

We and the nurses who work with us are prevented by law from receiving such patients into homes and hospitals unless they are certified, and we may then only receive them if we are the officers of mental hospitals or of licensed houses or if we receive but one patient at a time. Certification is, in fact, forced by law upon us and upon our patients if they desire to be properly treated or if their relations on their behalf so desire. The law, in short, steps between us and our patients and often prevents the treatment we deem scientific and proper. The law does this because it wishes to safeguard liberty.

If, then, the public and its legal advisers are of opinion that the mentally disordered are in danger at the hands of unscrupulous doctors, let us ask to be allowed to hand over freely (and with delight) all the proceedings associated with certification, forcible detention and release, to the law and its police officers. We should then relinquish a burden which it appears we are judged too weak to carry and too dishonest to be entrusted with. Such would be a simple and to many a satisfactory solution. Let science stand down and let inexperience and ignorance prevail. In the result we could at least point out that medical treatment was not in our hands in those particulars but in those of the law and its officers, while complaints as to this part of treatment would have to be directed to other quarters.

For the community the result would be, I suggest, unsatisfactory. If under the present system liberty is on the rarest possible occasions infringed (and personally I have never known of a case of wrongful detention) so is it in every case where an alleged offender, subsequently proved innocent, is remanded to gaol, or when innocent persons are condemned to terms of imprisonment; but under an alternative system in which certification, detention, and release become matters of judicial concern, many a person of unsound mind will go untreated and uncared for, intolerable conditions will be created for many a family, and many and violent assaults will occur. But the community does not realise this or from what we save it. So be it; but surely our measure is overflowing. We have borne the burden sufficiently long. Let it pass to other shoulders, to those who are of opinion that they know better than we do.—I am, Sir, yours faithfully,

Harley-street, W., March 1st. E. D. MACNAMARA.

A STANDARD DIET FOR INSULIN TREATMENT.

To the Editor of THE LANCET.

SIR,—After a few months' use of insulin on orthodox lines it became apparent that if diabetics throughout the country were to obtain the full benefit of the new treatment it was necessary to work out a much more simple method of arranging the diet and general control of the treatment.

The scheme outlined below has been so successful that even in hospital practice I generally use it instead of the older and more elaborate methods of estimating basal diet, sugar tolerance, &c., and gradually building up a diet. The time required to ascertain the right diet and the necessary dose of insulin is much shorter, while the end-results are equally good.

The general principle of the method is to give from the outset a diet capable of producing the number of calories required by the average patient to carry on his ordinary life. Elsewhere I have shown that there are many fallacies in the usual method of working out the basal diet and that there is no constant relationship between this basal diet and the adequate diet, but that the number of calories required by the average patient for an adequate diet is fairly constant. This diet is given, and if the patient cannot metabolise it without help he is given sufficient insulin to enable him to do so.

From the treatment of about 80 cases of diabetes it appeared that the average number of calories required daily was about 2300, and this was the number fixed on. The next question was how this number of calories should be made up. The amount of protein was fixed first. This must not be too low or body repair and growth cannot be maintained; it should not be too high or an unnecessary strain is thrown on the kidneys and the amount of potential carbohydrate may be excessive. Of the two faults it is obviously safer to give too much than too little. Disregarding the theoretical number of grammes per kilo of body-weight, about which the various authorities differ widely, I took Hutchison's broad estimate of the minimum requirements of the average man—viz., 80 g. of protein daily. This amount of protein will produce 320 calories. The remaining calories are made up from carbohydrate and fat and a satisfactory proportion of each is fixed. There has been much written about ketogenic and anti-ketogenic diets, but as a matter of fact some patients tolerate a much larger proportion of fat than others. Woodyatt's rule, however, is a useful one and in most cases errs on the safe side. The rule is that the fat should not exceed twice the carbohydrate plus half the protein. Taking the protein at 80 g., the carbohydrate would be 70 g., and the fat 185 g. if we take the nearest round figures necessary to maintain the right carbohydrate fat ratio and to produce in all about 2300 calories. These were the quantities taken in fixing the adequate diet which, for convenience, I called the "standard diet."

While it is easy for those of us who are constantly at it to work out different diets containing these proportions of carbohydrate, protein, and fat, the busy practitioner will find it an advantage to have one worked out for him, and the following example shows how it may be done with ordinary food-stuffs which suit the average taste. Of course, by studying the constituents of all the different articles of food the diet may be varied indefinitely so long as approximately the right amount of each constituent is retained. Anyone who has not the time or inclination to do so may confidently order the diet given below. A mild case, or one of average severity, where there is little acidosis or de-nutrition, need not stay in bed at all, and if his work is not very arduous, may carry on his usual life. Accurate diagnosis is *essential*. If clinical signs and symptoms are not conclusive of true diabetes a blood-sugar estimation must be done before commencing treatment.

"*Standard Diet.*"

Food.	Carbo-hydrate.	Protein.	Fat.
Three eggs	—	18	18
12 oz. 5 per cent. (green) vegetables	12	3	—
3 oz. butter	—	—	72
2½ oz. beef or mutton (lean)	—	20	12
2 oz. ham	—	12	16
2 oz. bacon	—	6	30
¼ oz. milk	6	4	4
1 oz. cream (thin)	1	1	6
½ oz. olive oil	—	—	15
2 oz. brown bread	26	3	1
¼ oz. porridge	18	4	2
1 oz. potato	6	1	—
1 oz. cheese (cheddar)	1	8	9
	70	80	185

In the case of meat, potato, &c., the weight given is that of the cooked article. If porridge is not liked an extra ounce of bread may be allowed, or half an ounce extra bread may be given if the potato be omitted. Again, instead of the ham, a patient may be allowed two ounces of fish and half an ounce extra butter, and so on. Weak tea, weak coffee, or beef-tea may be taken freely. The distribution of the meals may be left to the patient, but when insulin is given the meal following the dose should contain a fair proportion of the carbohydrate allowance. In most cases it is better to get the patient on to this diet gradually, and the directions I usually give are as follows:—

1st day	Diet as above but take	4 oz. bread,	1 oz. butter.
2nd day		3½ "	1½ "
3rd day		3 "	2 "
4th day		2½ "	2½ "

5th day, standard diet with 2 oz. bread and 3 oz. butter.

During this stage it is *essential* to test the urine each day for acetone or diacetic acid, and desirable to test it for sugar at the same time. The simplest plan is to instruct the patient how to test his own urine for sugar with Fehling's or Benedict's solution, and for diacetic acid by adding a little weak ferri perchloride solution to an inch of urine in a test-tube. He is instructed to report at once if any red colour is given with the latter test. If diacetic acid appears at all, or if acetone is present in any quantity, the amount of bread must be increased and the amount of butter diminished until the acidosis disappears. Another attempt may then be made by adjusting the amounts more gradually, or insulin started without further delay. If, however, no diacetic acid appears when the standard diet is reached the sugar may or may not have disappeared. If it has apparently gone specimens of urine at different times of day, especially an hour to an hour and a half after the meal containing the most carbohydrate, should be examined to make sure that the patient is really sugar-free. If so, go on with the diet, getting the patient to test the urine every day at first and afterwards once or twice a week. If weight, energy, and sense of well-being are normal continue indefinitely; if not, increase the diet first by adding more butter, cream or oil, keeping a sharp look out for acidosis. After the maximum amount of fat which can be tolerated is reached any further increase must take the form of bread or other carbohydrate. If sugar now reappears treat the case as described below where sugar has persisted from the first.

If there is still sugar in the urine after a week on the standard diet, or sooner if the amount of sugar is high, begin insulin treatment. Keep the diet the same, but give gradually increasing doses of insulin until the glycosuria is controlled. How is this done? Two specimens of urine are examined daily, one taken an hour to an hour and a half after supper, and the other before breakfast. Increase the insulin until there is just the faintest trace of sugar in one or other of these specimens. Whether the dose is pushed beyond this point depends, in the absence of blood-sugar estimation, on the intelligence of the patient and the amount of control available. If there is little opportunity for supervision, or the patient is not very intelligent, it is wiser to be content with this dose. On the other hand, an intelligent patient can usually increase the

dose of insulin unit by unit so as to keep the urine entirely sugar-free and make certain that his blood-sugar is about the normal level. A feeling of slight malaise warns him when he is having rather much, and he continues with a dose slightly less than this amount. During this time the diet is, of course, constant.

When should the insulin be given and how should the dose be increased? Start with 5 units before breakfast and increase to 10, 15, or 20 units at the same time. If more than 20 units are needed give two doses a day, one before breakfast and the other before tea, giving the larger dose before breakfast. Do not increase by more than 5 units at a time. At first the increase may be made every day, but when the sugar is getting small in amount the intervals should be longer and the increase should be by 1 or 2 units instead of 5. Never give insulin near bedtime. If this routine is carefully followed the danger of serious hypoglycæmia is negligible, although it is well for the patient to have a little glucose always available. The patient is taught to give himself the insulin as well as to test his own urine. He keeps a note of the dosage and the urinary findings and reports to the doctor from time to time.

As long as the patient feels well and his urine is normal he goes on with the standard diet and the requisite amount of insulin. If the diet is inadequate it is increased on the lines previously described—viz., first by increasing the fat so far as this can be done without the appearance of acidosis, and secondly by increasing the carbohydrate. If the latter is necessary there will be a recurrence of glycosuria which must be met by a further increase of insulin. On the other hand, if the diet proves to be slightly in excess of requirements, a rare occurrence, both the diet and the dose of insulin are reduced. In the great majority of cases, however, the standard diet is about right, and, with or without the help of insulin, the patient will maintain a normal weight and have sufficient energy to carry on his usual life in health and comfort. More severe cases where there is marked acidosis, denutrition, threatened coma or gangrene, should be kept strictly in bed. They should have a diet comparatively rich in carbohydrate and poor in fat, while insulin is administered from the outset. Once the acidosis is overcome the diet is adjusted until the standard diet is reached, and the amount of insulin necessary to metabolise this diet is ascertained as before.

By following this simple scheme of treatment most sufferers from diabetes can get adequate treatment at the hands of their own doctors, and complications of the disease, such as coma and gangrene, will in great measure be abolished.

I am, Sir, yours faithfully,

Swansea, Feb. 25th, 1924. A. CLARKE BEGG.

HUMANITY OF METHODS OF SLAUGHTER.

To the Editor of THE LANCET.

SIR,—Apropos of Dr. Leonard Hill's article in your issue of Dec. 22nd, 1923, and the letter from Dr. Duncan Forbes advocating the abolition of the pole-axe for the slaughter of oxen, it may be of interest to record the experience of Mr. C. E. Hagley, superintendent of the Bloemfontein municipal abattoir. There the humane-killer has been employed during the past 11 years for the slaughtering of 51,723 bovines and 11,813 pigs. Throughout this period there has been no accident, the nearest approach to one being with the first gun issued, which had the striker unprotected. A restless ox struck the striker with its horns, but the bullet penetrated the skull and dropped the animal. The humane-killer is handled only by the superintendent and his assistants; native slaughter-men are not allowed to use it. During the period it has been in use there have been no complaints concerning insufficient bleeding or the keeping quality of the meat of animals killed by this method.

I am, Sir, yours faithfully,

W. A. BERRY,

Feb. 14th, 1924. Medical Officer of Health, Bloemfontein.

IN THE MATTER OF "DICHOTOMY."

To the Editor of THE LANCET.

SIR,—In compliance with a widely felt desire, a meeting of the consultants and specialists of this city was held at the Birmingham Medical Institute on Monday, Feb. 25th, for the consideration of the subject of "dichotomy" or fee-sharing. The meeting was very largely attended and letters were received from a few who were absent. After full discussion, including reference to the numerous cases in which patients ask what will be the total cost of treatment in a nursing-home or private hospital, the following resolutions were passed unanimously:—

1. It is improper for a Consultant to transfer any portion of his consultation- or operation-fee to the Practitioner who has called him in. The Consultant who offers or agrees to such payment, however innocently, is open to the suspicion of paying a "commission" for his own advantage. The Practitioner who accepts or asks for it cannot maintain the position of a trusted and unbiased adviser as to the need for a consultation and the selection of a Consultant.

2. No Consultant or Specialist shall pay to the General Practitioner who is associated with him in a case any part of an operation-, consultation-, or so-called "inclusive" fee, unless he informs the patient or his representatives of the services for which the payment is made and the amount of such payment.

It was further resolved that a report of the meeting should be sent to every consultant and specialist in the Birmingham district for his or her signature as evidence of agreement, and to all members of the medical profession in the district for their information.

PRIESTLEY SMITH, Chairman of the Meeting.
LEONARD G. PARSONS, A. W. NUTHALL, Secretaries.

Birmingham, Feb. 28th, 1924.

LEPROSY: A SELF-HEALING DISEASE.

To the Editor of THE LANCET.

SIR,—In the report of the meeting at the Mansion House in support of the British Empire Relief Association in your issue of Feb. 9th, Sir Leonard Rogers is stated to have "briefly outlined the researches which enabled him to establish the important principle that by the injection of soluble products of the active portions of the old Indian remedy for leprosy, chaulmoogra oil, the bacillus of the disease could be destroyed within the body, with clearing up of all symptoms, as well as of the infectivity of the disease, and that similar preparations derived from cod-liver and other oils were also effective in leprosy." And in a leading article summarising the views of Dr. Ernest Muir it is stated that during the first two stages of the disease "the chief object of treatment is to restore the lowered tissue resistance."

In papers which you have been good enough to publish in THE LANCET at various times in the last ten years I have endeavoured especially to show that an increase of lipase in the blood and tissues is an important factor in natural and therapeutic immunisation and induced resistance. I hope this aspect may not be lost sight of in the present campaign. With regard to leprosy, in the *Journal of Tropical Medicine and Hygiene*, 1921, xxiv., 161 (referring to the treatment by sodium chaulmoograte and sodium morrhuate in leprosy and tuberculosis introduced by Sir Leonard Rogers), I pointed out that these salts increased the action of lipase in vitro in the same way as sodium oleate; that in view of the ascertained action of sodium oleate in vivo, "it would seem reasonable to infer a direct stimulating action primarily of tissue lipolysis in explanation of the therapeutic effect of sodium morrhuate, and at any rate, part explanation of the effect of sodium gynocardate (chaulmoograte)." I went on to say, "the idea or principle underlying treatment is the production of the lipolytic ferment in the tissues which in tuberculosis acts on

the fats and lipoids of the tubercle bacillus and is injurious to it; and presumable also in leprosy on the lepra bacillus." The main outcome of my research work has been to show that natural and increased production of lipase or fat-splitting ferment in the blood and tissues is an important factor in the protective processes or induced resistance of the body. I am, Sir, yours faithfully,

J. A. SHAW-MACKENZIE, M.D. Lond.

King's College, London, Feb. 29th, 1924.

TREATMENT OF UTERINE FIBROIDS.

To the Editor of THE LANCET.

SIR,—The discussion held on Feb. 25th at the Medical Society, and reported last week in your columns, gives radiologists an opportunity of revising their views. Briefly the position is as follows. Gynæcologists either (1) rely largely on X rays in selected cases; (2) fear X rays as uncertain in their cure; or (3) dread possible injury to healthy tissues.

My own view is: (1) That the diagnosis of fibroid uterus should be made by a skilled gynæcologist, if necessary under a general anæsthetic. (2) Cases should be carefully selected; women nearing the menopause with small fibroids, causing hæmorrhage, are specially suitable. (3) Ovarian cysts and tumours or suppurative diseases of the ovaries, tubes, or uterus are unsuitable for X ray treatment. In selected cases the results are all that can be desired. As to technique, those who have adopted the Erlangen method of deep X ray therapy are inclined to apply it to fibroids. An inoperable cancer may justify a desperate remedy, which may inflict considerable damage on healthy structures, but it is unnecessary to subject patients with fibroids to the discomfort and malaise which almost invariably follows the Erlangen treatment.

Radiologists are *not* justified in damaging healthy tissue while curing fibroids, nor need they. With Coolidge tubes and modern apparatus, dosage and penetration can be measured with great accuracy, and the soft rays which injure the skin can be filtered out. The exact dose can be repeated at will, and no damage need accrue from X ray treatment.

I am, Sir, yours faithfully,

Upper Wimpole-street, March 3rd. ALFRED C. JORDAN.

AUTO-HÆMO-THERAPY.

To the Editor of THE LANCET.

SIR,—Dr. S. G. Billington's interesting article in your last issue on Auto-hæmo-therapy, describing the results obtained by the use, in certain infections, of a "hæmo-vaccine" composed of coccoid bodies derived from the blood, brings up a question which I believe will prove to be of considerable importance. In a paper intended for publication I have noted the formation of small spheres and granules produced by the exposure of washed red cells to the rays of the tropical sun, even for only a few minutes. These granules, which I take it are of the same nature as the coccoid bodies described by Dr. Billington, are evidently the products of the disintegration of red cells. I have endeavoured to show that such disintegration products, whether produced by the action of the sun, by heat to 56° C., by grinding in a mortar, or by bacterial action are toxic, and that some of the phenomena of bacterial infection may be attributed to this toxin rather than directly to a bacterial toxin. Further, that the injection of destroyed red cells has a therapeutic value, presumably by setting up an immunity to the toxin which is the cause, wholly or in part, of the symptoms of the disease. Though we have approached the subject from different angles and employ an entirely different technique, I believe that Dr. Billington and myself are dealing with the same phenomenon—namely, the toxic nature of red cells just sufficiently destroyed to allow of their stroma being diffused into the circulation.

I am, Sir, yours faithfully,

Leicester, March 2nd, 1924. T. C. CLARE.

Obituary.

ROBERT GUTHRIE POOLE LANSDOWN, M.D., B.S. DURH.

THE sudden death of Mr. R. G. P. Lansdown consulting surgeon to the Bristol General Hospital occurred on Feb. 17th in a syncopal attack, at the ag of 60. The news of his death was received with consternation by all who knew him, for he had been i full work up to the morning of his death.

Mr. Lansdown was born in September, 1863, i Bristol. His father, Francis Poole Lansdown, wa surgeon to the Bristol General Hospital from 1861 t 1893, and his grandfather, Joseph Goodale Lansdown held the same post from 1832 to 1861, being a membe of the original staff of the hospital. Robert Lansdow was educated at Clifton College and Epsom College passed his preliminary science examination fro University College, Bristol, and went on to complet his professional training at Guy's. In 1889 he passe his M.B., B.S. examination at Durham, gained hi Conjoint diploma in 1890, and took his M.D. Durh in 1891. After serving as clinical assistant, assistan house surgeon, house surgeon, and resident obstetri officer at Guy's, he joined his father in practice a Clifton in 1891. Almost at once he became associate with the Bristol General Hospital, an associatio which continued till his death and was the dominan factor in his professional life. His first appointmen to the hospital was that of anæsthetist, which he hel till 1893, when he was appointed assistant surgeon becoming a full surgeon three years later. In 1918 h became dean of the honorary staff, retiring fro active service in September, 1923, under the age rul of the hospital. On his retirement he was electe a consulting surgeon to the hospital, and proceede to prove that his office was more than a mere titl by attending regularly at the weekly surgical consulta tions with his colleagues. To these years of hospita work he gave the most devoted service. He wa a true friend to everyone connected with the plac and gave himself to upholding and raising the standar of its work in all phases of its activity. In 1902 h dropped his general practice and limited himself t consulting surgery; but his experience of genera practice stood him in good stead, and was reflected i his relations with the practitioners of the distric as well as in the very practical character of his surgica teaching. In addition to his work as dean of th hospital staff, he did good service as lecturer o practical surgery for a number of years at the Univer sity College (later the University) of Bristol, an held many other offices in the University. Hi interest was always in clinical work, and he lost n opportunity of imparting the fruits of a wide experi ence to his students as well as his colleagues. H was extremely methodical and neat in his way and this was particularly to be observed in his surgica technique. No matter how great the demands on hi time he was always able to give his attentive considera tion to any question put before him. During muc of his surgical career he gave a great deal of though to the provision of private hospital accommodation At the time of his death he was chairman of th committee of the Chesterfield Place Nursing Hom and was largely responsible for recent development destined to enlarge it and convert it into a first-clas private hospital. Soon after settling in Bristol h became Surgeon-Captain to the Gloucestershire Roya Artillery Volunteers, and retained this appointment fo many years. On the outbreak of war in 1914 he wa mobilised with the Second Southern General Hospita as a Major in the Territorial Force, and until it demobilisation in 1919 continued to serve as surgeon t the Royal Infirmary section of that unit. He occupie the presidential chair of the Bath and Bristol branc of the British Medical Association, and also of th Bristol Medico-Chirurgical Society. For 24 years h was honorary surgeon to the Clergy Daughters

School. As a governor of the Queen Victoria Jubilee Convalescent Home he concerned himself much with the provision of time and place for recovery after operations and serious illness. He was the author of many papers on surgical subjects which appeared in various professional journals.

Lansdown was a diligent worker, but he was also a very good holiday-maker. Wherever he went he found occasions for his two great hobbies, motoring and photography. Less than 48 hours before his death he gave a delightful address to the Bristol Medical Club on "Rambles," illustrated by a number of beautiful lantern-slides taken on his holidays. There were many other activities that went to make a very full life. One trait in particular, his aptitude for acting, gave him much pleasure and made him a mainstay of the Bristol Medical Dramatic Society. In his time he was a good swimmer and received the bronze medal of the Royal Humane Society for saving a child from drowning in a rough sea at the imminent risk to his own life in the summer of 1883 near Torquay.

A colleague writes of him: "Lansdown was a most loyal friend and was always willing to listen to the troubles of other people and give help and advice. He was not easily dismayed by adverse circumstances and was often responsible for rallying a forlorn hope and leading it to victory. His cool and steady judgment was a great asset to the institutions with which he was connected, and his death is a grievous blow to the work of his profession in Bristol."

A sense of this loss received striking expression in the very large attendance of doctors at his funeral service on Feb. 20th at St. Paul's, Clifton, where he was a sidesman and had attended service only a few hours before his death. Mr. Lansdown married, in 1893, Miss Alice Anna Griffiths, of Cardigan, who survives him, with a son, who is a medical man, and a daughter.

JOHNSON SYMINGTON, M.D. EDIN., F.R.C.S. ENG. AND EDIN.

Dr. Johnson Symington, emeritus professor of anatomy at Queen's University, Belfast, died on Feb. 24th in Edinburgh, aged 72. Prof. Symington was born in 1851 and was educated at Taunton and at Edinburgh University, where he graduated in medicine in 1877. Later he was appointed lecturer in anatomy at the Minto-street extra-mural school in Edinburgh, and his success as a teacher there gained for him, after some years, the chair of anatomy in Queen's College, now Queen's University, Belfast. Prof. Symington held many various administrative and educational offices. He was examiner in the Royal University of Ireland, of which he was an ex-Fellow, and in 1903 he was appointed President of the Section of Anthropology at the British Association Meeting in Southport. For three years, from 1904 to 1906, he was President of the Anatomical Society of Great Britain and Ireland. The honorary degree of LL.D. was conferred upon him by Queen's University, Belfast, and in 1903 he became a Fellow of the Royal Society.

We have received the following appreciation of Prof. Symington from his colleague, Prof. T. H. Milroy, M.D.:—

"Practically from the beginning of his undergraduate career until the close of an active professional life, Johnson Symington devoted himself to the subject of anatomy, and the keen zest, natural to the young worker, never showed any sign of abatement with the passage of the years. From the very outset he recognised that teaching and investigation must go hand in hand, and, although both at Minto House, Edinburgh, and in Belfast his fame as a teacher might in some respects have satisfied him, he never allowed his love of teaching to encroach upon his activities as an investigator. At all times the outlet for his energetic personality was research, and thus British anatomy owes him a deep debt of gratitude for valuable contributions in many departments of topographical anatomy. While lecturer in anatomy in Minto House, Edinburgh, he published a number of papers in the *Journal of Anatomy*, dealing with applied anatomy, the structure of the central nervous system, and splanchnology. During his period of tenure of the Belfast chair, he published his most important work. From 1903 onwards his interests were mainly centred upon cranio-cerebral topography. In 1903 he described a method devised in order to demonstrate the relations of the deeper parts of the brain to the surface, and from this period onwards until the publication of the work in 'Quain's Anatomy' and elsewhere, he carried out an elaborate series of investigations with a wealth of material which must have aroused the envy of many less favoured teachers. Under the joint editorship of Sir Edward Sharpey Schafer and Prof. Symington, Part 1 of Vol. III. of 'Quain's Anatomy' dealing with the anatomy of the central nervous system appeared in 1908, and in this volume the results of many years' fruitful labour were incorporated, the macroscopic sections being left entirely in Symington's hands. Part 2 of this volume, dealing with the peripheral nervous system and sense organs, was published under the same editorship in the following year. In 1914 the volume on splanchnology appeared under the editorship of Symington, assisted by Dr. P. T. Crymble, and for this volume, as in the case of the preceding ones, an immense amount of work was carried out in his department. The work of so many years' strenuous research received due recognition by his fellow anatomists.

Although so actively engaged in his own department, he did not allow this work to monopolise his attention, and so we find him as the years went on playing a more and more important part in general university administration. During 24 years of active service in Ireland he devoted himself wholeheartedly to the interests of the old Queen's College and later the Queen's University of Belfast. As registrar, senator, and university commissioner he served his college in a way which will never be forgotten. The University of Belfast has good cause for revering the memory of one who never spared himself in maintaining and advancing her interests. His old pupils in Belfast and Edinburgh will be pleased to learn how highly their old chief appreciated their generosity in raising funds to endow a prize bearing his name to be awarded for research by junior anatomists on anatomical subjects. He was delighted to learn that the Anatomical Society had made their first award of this prize about a year ago. May his fine example of devoted service inspire young anatomists to follow in his footsteps."

Prof. Symington was a widower, and to his daughter we offer sincere sympathy in her bereavement.

HENRY WALTER VERDON, F.R.C.S. ENG.

Dr. Verdon, who died on Feb. 25th at Streatham Hill in the seventy-fourth year of life, was a man of all-round culture and a barrister-at-law of the Middle Temple. He qualified M.R.C.S. from St. Thomas's Hospital in 1873, continuing his studies at Paris and Brussels, and taking the Fellowship in 1876. After holding resident appointments, both at St. Thomas's and Westminster Hospitals, he settled down in general practice in the south of London, diseases of the heart gradually becoming his chief interest, and finally his specialty. A series of books and pamphlets on angina pectoris came from his pen, the last of which, appearing in 1920, laid stress on the hyper-irritability of the central nervous system as the basis of the anginous habit. In this work he was able to draw upon a large storehouse of facts and observations coming under his own experience. Dr. Verdon was a fine example of the utilisation of a general practice for intensive study of a special problem.

WILLIAM ARTHUR BOND, M.D. CAMB., M.R.C.P. LOND.

WE regret to record the death of Dr. W. A. Bond, who only retired in 1921 from the chief health officership of Holborn. His death occurred at Torquay on Feb. 20th as the result of pneumonia following on influenza. Dr. Bond was educated at King Edward VI. School, Norwich, and St. John's College, Cambridge, where he was a scholar and graduated as fourteenth wrangler. He went on to St. Thomas's Hospital, holding there the position of house physician, and later house appointments at Queen Charlotte's and the South-Western Fever Hospitals. For a while he studied in Paris, after which he took the M.R.C.P. Lond. His earliest public health work was done as medical officer to the St. Olave and Holborn

District Boards of Works, when he gained experience of the hygienic problems of meat storage and transport, which then needed much attention. When Holborn amalgamated with St. Giles, Dr. Bond became full-time medical officer of health for the combined Metropolitan Borough of Holborn, an appointment which engrossed all the busiest years of an active life. Gradually his recommendations resulted in a thorough overhauling of meat inspection, and in a series of prosecutions which initiated reform. Outside his official life he was active in his profession, being hon. secretary to the Royal Institute of Public Health and one of the earliest supporters of the Society of Medical Officers of Health, which for several years actually met at his office. His work was careful and systematic, and his writings, both official and quasi-popular, were lucid and finished. Although he did nothing to bring himself prominently into the public eye, the public health service will remember Dr. Bond with honour and gratitude.

EFFINGHAM CARROLL MACDOWEL, M.D. DUB., F.R.C.P. IREL.

Dr. E. C. MacDowel, surgeon to the Sligo County Infirmary, died on Feb. 23rd, after a protracted illness, at the age of 73. Born in 1851, he was the eldest son of the late Dr. Benjamin MacDowel, professor of anatomy and chirurgery in Trinity College, Dublin. He was educated at Trinity College, where he graduated Bachelor of Arts, had a distinguished student career both in arts and in medicine, and later went to Oxford University as Radcliffe Medical Scholar. Having obtained his A.B. he took the M.D. Dub. in 1875. While still a young man he was elected surgeon to the Sligo County Infirmary and he continued to perform the duties of that post for some 46 years until a few months ago. He was also visiting physician to the Sligo and Leitrim District Lunatic Asylum. In 1883 he became a Fellow of the Royal College of Physicians of Ireland, a qualification which was exceptional among country practitioners in Ireland. In the year 1907–08 he was president of the Irish Medical Association, which in that year held its annual meeting in Sligo. Dr. MacDowel was one of the leading practitioners in the west of Ireland and for many years he enjoyed a large consulting practice. He was a man of much culture, a sound diagnostician, possessed of considerable operative skill, and he took much pains to keep abreast of the advances in medical and surgical knowledge. His health had suffered since he lost his eldest son in the war. His next surviving son, Dr. F. L. H. MacDowel, is a surgeon in the Navy.

THE LATE DR. T. DOBSON.—The death occurred recently of Thomas Dobson, M.D. St. And., of Windermere, in his eighty-third year. Born in 1840 he studied at Charing Cross Hospital, and in 1862 he qualified M.R.C.S. and obtained the M.D. St. Andrews. In the same year he went to Windermere as assistant in a practice which he took over a few years later. As a practitioner he enjoyed success and respect in the district, and to his professional qualities was added a charm of manner which endeared him to his patients. He retired in 1888, and since then had continued in many useful public activities.

WORTHING HOSPITAL.—An important extension of this hospital was determined on at the annual meeting of the governors held on Feb. 29th, the idea being to increase the number of beds from 46 to 100. It was not thought possible to proceed with the scheme as a whole at once, but the present men's and women's wards will be enlarged first, with the object of securing the recognition of the hospital as a training centre for nurses. In 1920 the excess of expenditure over income was £1035. In 1921 this figure dropped to £453, and in 1922 to £135, but in 1923, notwithstanding the fact that the total expenditure was £734 in excess of the expenditure in the previous year, there was a balance in hand of £662. This was due largely to the result of the household box scheme, the amount received from this source during the year amounting to £1538, and since its inauguration to the sum of £1820.

Medical News.

UNIVERSITY OF OXFORD. — *Rolleston Memorial Prize, 1924.*—This prize, which is now of the value of about £100, is awarded every two years, under the condition stated below, for original research in any subject comprised in the following list: Animal and Vegetable Morphology, Physiology and Pathology; and Anthropology. A candidate will be eligible (1) who has not either passed the examinations for the B.A. degree or the B.M. degree at Oxford, or for the B.A. degree or the M.B. degree at Cambridge, or been admitted as a candidate for the degree of B.Sc. at Oxford or as an advanced student for the degree of B.A. at Cambridge; (2) who has exceeded a period of six years from attaining one or other of these qualifications, or from his attaining the first of such qualifications if he has attained more than one; (3) who has exceeded ten years from his matriculation. The next award will be made in Trinity Term, 1924. Candidates wishing to compete must forward their memoirs to the Registrar of the University of Oxford before March 31st, 1924. The memoirs may be printed, typewritten, or in manuscript; should be inscribed "Rolleston Memorial Essay"; and should bear the name and address of the author. Memoirs already published are admitted to the competition. No account will be taken of any research which has not been prosecuted by the candidate subsequent to his matriculation.

Christopher Welch Scholarship in Biology, 1924.—An examination for this scholarship will be held at the University Museum in July, 1924. Candidates must be undergraduate members of the University who have not exceeded the twelfth term from their matriculation. They may offer any one of the subjects Botany, Animal Physiology, Zoology, and they must give notice of the subject selected by them to the Registrar of the University not later than March 1st, 1924. They must further enter their names in person or by letter at the University Registry not later than Tuesday, April 1st, and must at the same time produce or send to the Registrar of the University evidence of their capacity for original observation and research. A candidate may also submit to the examiners any original work previously done by him.

UNIVERSITY OF LONDON. — A meeting of the Senate was held on Feb. 27th, the Vice-Chancellor, Mr. H. A. Waring, being in the chair. Mr. Richard Lake has been appointed as the first holder of the Geoffrey E. Duvet Lectureship in Otology, as from Jan. 1st, 1924. Mr. F. J. Steward was appointed to represent the University on the Council of the Fellowship of Medicine.—In connexion with a scheme which the Senate have under consideration, the Vice-Chancellor announced that the Chancellor (the Earl of Rosebery) had handed to the Principal Officer a cheque for £5000 in contribution towards the sum needed for the acquisition of an athletic ground for the use of the students of the University. A resolution was adopted conveying the warmest thanks of the Senate to the Chancellor for his gift.

THE annual conference of the British Hospital Association is to be held in London on Thursday and Friday, June 19th and 20th.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The second half of the intensive course at the Royal Northern Hospital will begin on Monday, March 10th, and continue throughout the week. Apart from the demonstrations and lectures by members of the Royal Northern staff, the course will include a demonstration on Wednesday morning, March 12th, at the North-Eastern Fever Hospital, and on Thursday afternoon, March 13th, at the Central London Ophthalmic Hospital. A special course in Gynæcology at the Chelsea Hospital for Women began on Monday last, and will continue till the end of the month. Entry may be made at any time for the remainder of the course, which consists of clinical demonstrations in the wards and out-patient department, followed by lectures on operations in the theatre. At the Royal Free Hospital on Wednesdays, at 5.30 P.M., Dr. C. B. Heald is giving a series of lecture-demonstrations on recent advances in medicine electrical treatment. Beginning on March 8th, at 11 A.M. and on successive Tuesdays and Saturdays, Dr. Porter Phillips and Dr. Thomas Beaton are giving a series of clinical lectures on the Diagnosis and Symptomatology of Mental Diseases, the Psychoneuroses, and the Medico-legal Aspect of Insanity. At the Royal Waterloo Hospital for Children and Women there will be given a three weeks' course on diseases of children from March 17th to April 5th. The course will occupy each afternoon with lectures, demonstrations, ward work, and out-patient clinique. Full particulars regarding any of the above courses, with copies of each syllabus, will be forwarded on application to the Secretary to the Fellowship of Medicine, 1, Wimpole-street, W. 1.

FOOD EDUCATION SOCIETY.—Dr. Harry Campbell and Sir Harry Baldwin have been respectively elected chairman and vice-chairman of this society.

ENCEPHALITIS LETHARGICA IN MANCHESTER.—In the week ending March 1st 13 cases were reported, and in the previous week 16 cases with 2 deaths. The first case in the present outbreak was notified on Jan. 2nd; on Feb. 2nd, 3 cases; on Feb. 9th, 9; on Feb. 16th, 13; and on Feb. 23rd, 16 cases were notified. This year the deaths have numbered 5 out of 42 cases.

ACADÉMIE DES SCIENCES ET LETTRES DE MONTPELLIER.—Two Alphonse Jaumes prizes will be awarded in 1925, one for an essay on a subject of general therapeutic interest, and one for an essay on a medico-legal theme. Each prize will be of the value of 2000 francs. Essays, written or printed, should be in French, and should be deposited before Dec. 31st at the Secretariat of the Académie. Further particulars can be obtained from Mr. F. Carrieu, 5bis, rue de la Merci, Montpellier.

FOOT-AND-MOUTH DISEASE COMMITTEE.—A committee has been appointed by the Ministry of Agriculture "to initiate, direct, and conduct investigations into foot-and-mouth disease, either in this country or elsewhere, with the view of discovering means whereby the invasion of the disease may be rendered less harmful to agriculture." The personnel of the Committee is as follows: Sir Charles Sherrington, P.R.S. (chairman), Dr. J. A. Arkwright, Prof. W. Bulloch, F.R.S., Prof. J. B. Buxton, Captain S. R. Douglas, F.R.S., Mr. S. H. Caiger, Sir John McFadyean, Prof. C. J. Martin, F.R.S., Prof. Robert Muir, F.R.S., Sir Stewart Stockman, Mr. H. G. Richardson, and Mr. W. G. Wragg (secretaries).

CHADWICK PUBLIC LECTURES.—A lecture, illustrated by lantern slides, on the Small-pox and Vaccination Question To-Day, will be given by Dr. C. Killick Millard in the Council Chamber, Old County Hall, Spring Gardens, Charing Cross, London, W.C., on March 10th, at 5.15 P.M. Sir Arthur Newsholme will preside.—A lecture, illustrated by diagrams, on the Sanitary Inspector in the Machinery of the Public Health Service will be given by Mr. John T. Quinton, in the same place, on March 28th, at 8 P.M., Sir William Collins presiding. Admission is free to both lectures.

INSURANCE FUNDS AND VOLUNTARY HOSPITALS.—At the annual meeting of the Manchester Children's Hospital the chairman, Lord Colwyn, called attention to the fact that one-half of the patients who came to these hospitals were insured under the Insurance Acts. Actuarial examination showed that the funds accumulated under these Acts show a surplus of £17,000,000, but the hospitals got nothing from the funds. It costs, he said, £5,000,000 a year to deal in the hospitals with these insured persons, and that sum voluntary subscribers from among the generous public have to pay, and he expressed the view that hospitals have a fair and justifiable claim on this fund. But for the special grants of £5000 from the proceeds of the Lord Mayor's Fund, and £1500 from the Voluntary Hospitals Commission, and for the fact that the subscriptions were £900 more than last year, there would have been a heavy deficit on the year's working.

LARGE SCALE PRODUCTION OF INSULIN BY THE "ACETONE-PICRATE PROCESS."—The Finance Committee of the Middlesex Hospital Medical School, at their meeting on Feb. 26th, report that so satisfactory has the new process recorded in THE LANCET (Feb. 16th, 1924, p. 330) by Dr. E. C. Dodds and Dr. F. Dickens turned out that large amounts of insulin can be prepared at a much reduced cost. Their process has been found to be eminently suited to the production of insulin on a large scale. It is to be understood that the insulin prepared in the Biochemical Department is only for experimental purposes and for the supply to cases of diabetes under treatment in the hospital, but, on going into the matter of costs, the Finance Committee find that the costs of preparation have been so reduced by the employment of the water process that they have been able greatly to reduce the price of insulin to the hospital. It was not easy to determine what the ultimate cost might be after further experience of the method, but it was decided to recommend an immediate reduction to something under 2*s.* per 100 clinical units. This price was arrived at after allowing for all overhead charges, cost of materials, salaries, and a margin of profit, which could be used for the purposes of continuing experiments with a view to the further improvement of technique and a still greater reduction in cost. This price is to be taken as the first instalment of the results to be expected from the new method, and it is confidently anticipated that a further substantial reduction in the price will be possible.

LISTER MEMORIAL FUND.—Sir Charles Sherrington, P.R.S., will unveil a monument to Lord Lister in Portland-place, London, W., on March 13th, at 11.30 A.M. Lord Hambleden will speak on behalf of the subscribers.

JOINT COUNCIL OF THE ORDER OF ST. JOHN AND BRITISH RED CROSS SOCIETY.—Dr. F. N. Kay Menzies has been appointed to succeed the late Sir Napier Burnett as Director of the Council's Department of Hospital and Medical Services, and will take up his duties on April 1st.

LEGION OF HONOUR.—The following appointments or promotions have just been made by the French Minister of Hygiene to the higher ranks of the Légion d'Honneur:—

Grand Officier.—M. Tuffier, chirurgien honoraire des hôpitaux.
Commandeur.—M. de Martel de Janville, chirurgien de Paris.
Officiers.—MM. Arrou, chirurgien honoraire des hôpitaux à Paris; Coussol, chef de bureau au ministère de l'hygiène; Hugenschmidt, docteur en médecine, à Paris; Henri Lévy dit Lévy-Bieg, docteur en médecine; Ménard, docteur en médecine.

OXFORD OPHTHALMOLOGICAL CONGRESS.—This congress will assemble at Keble College on the evening of Wednesday, July 2nd, and the meeting will be held on July 3rd, 4th, and 5th. On the morning of July 3rd a discussion on the General Principles of the Treatment of Convergent Concomitant Strabismus, with exclusion of the description of details of operations, will be opened by Dr. E. Landolt, of Paris, and Dr. Ernest Thomson, of Glasgow. The official dinner of the congress will take place on the evening of July 3rd. The Doyne memorial lecture will be delivered on the morning of Friday, July 4th, by Dr. T. Harrison Butler, the subject being Microscopy of the Living Eye, with especial reference to the Gullstrand Slit-lamp. Members intending to take part in the discussion or to contribute either papers or demonstrations are asked to notify the hon. secretary at their early convenience.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held on Friday, March 14th, in the Town Hall, Brighton, when discussions will take place on (1) the Schick Test and Immunisation against Diphtheria, to be opened by Dr. Duncan Forbes; (2) Ionisation in the Treatment of Ear Discharge, to be opened by Dr. Rutherford Cramb; (3) the Drainage of Brighton, to be opened by Mr. Harry Tillstone. The chair will be taken at 7.30 P.M. by Dr. Louis C. Parkes. The following will take part in the discussions: Drs. J. Cates, C. M. Fegen, A. Greenwood, F. C. Linton, H. P. Newsholme. On March 15th visits will be paid to the school clinic, school buildings and abattoir, and the pavilion, and to a farm to see the production of certified milk.

ROYAL COLLEGE OF SURGEONS IN IRELAND: CHARTER DAY DINNER.—This dinner was held in the College Hall last Saturday evening, March 1st, the President, Sir W. I. de C. Wheeler, in the chair. H.E. the Governor-General was the principal guest, and there were also present Lord Shaw of Dunfermline, the Lord Chief Justice of Ireland, the Recorder of Dublin, the Master of the Rolls, the Provost of Trinity College, the Vice-President of the Royal College of Physicians of Ireland, and Mr. James Sherren, surgeon to the London Hospital. The President, in proposing the "Prosperity of Ireland," referred to the progress of the country in the last year or two from disorder to order, and from instability to security. He said that he had been asked if it would be possible to accommodate in Dublin some 500 American surgeons, who were coming to study Irish methods of surgery. The progress of science was an essential condition to the prosperity of the country. The Governor-General, in his reply, took the opportunity of defending the medical service of the National Army against certain wanton charges of neglect or cruelty that had been brought against them. Into some of the more explicit of these charges he had personally inquired, and he had found that they were baseless. Sir F. Conway Dwyer proposed the "Learned Professions," and referred to the notable public services, in their several capacities, of Lord Shaw, of the Provost of Trinity College, and of Mr. Sherren. Lord Shaw, in his reply, expressed his friendly feelings towards Ireland, and his admiration for the recently framed Irish Constitution. Mr. Sherren entertained the audience with reminiscences of his early acquaintance with Ireland, when he followed the profession of sailor. The Provost of Trinity College, the Lord Chief Justice, the Vice-President of the College of Surgeons, and the Vice-President of the College of Physicians also spoke. At the end of the proceedings, the Governor-General, in proposing the toast of the "President," presented him, on behalf of the members of the Council of the College, with a handsome piece of plate. Sir William Wheeler's term of office comes to an end in June next. Owing to the regretted illness of his predecessor he has had to perform the duties of President for close on four years.

MEDICAL SOCIETY OF LONDON.—The annual dinner will be held at the Grand Hotel, Trafalgar-square, London, W.C., on Wednesday, March 12th, at 7.30 P.M.

MENTAL AFTER-CARE ASSOCIATION.—The annual meeting of this association will be held on March 11th at the Mercer's Hall, Ironmonger-lane, London, E.C., when Sir Charles C. Wakefield will preside.

SOCIETY FOR THE STUDY OF INEBRIETY.—The annual meeting of this society will be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., on Tuesday, April 8th, 1924, at 4 P.M., when Dr. Bedford Pierce will open a discussion on Mental States in Alcoholism.

THE ANGLO-RUSSIAN MEDICAL COMMITTEE.—A committee has been formed under this title, which is also described as a "Public Health Contact Committee," its object being to obtain mutual information on medical and sanitary work and organisation in England and Russia. The scope of the committee has not yet been defined, but will be settled at the first meeting of the committee, which will take place immediately. Dr. L. Haden Guest, M.P., is acting as honorary secretary. One of the first questions for consideration will be the possibility of fighting epidemics on international grounds, the practical outcome of which would be the giving of assistance to Russia in the anti-malarial campaign.

Parliamentary Intelligence.

HOUSE OF LORDS.

THURSDAY, FEB. 28TH.

Lord MUIR-MACKENZIE, on behalf of the Government, introduced a Bill to consolidate the existing Health Insurance Acts.

TUESDAY, MARCH 4TH.

National Health Insurance.

The Government's Bill to consolidate the existing National Health Insurance Acts was read a second time.

HOUSE OF COMMONS.

TUESDAY, FEB. 26TH.

Small-pox in British and Indian Armies.

Mr. WHITELEY asked the Secretary of State for War how many cases of, and deaths from, small-pox occurred in the various commands of the British and Indian armies during the years 1921 and 1922.—Mr. STEPHEN WALSH replied: The following are the statistics asked for:—

British Army.

Command.	1921.		1922.	
	Cases.	Deaths.	Cases.	Deaths.
India	32	7	25	10
Iraq	18	4	6	Nil
Turkey	Nil	Nil	5	Nil
All other commands ..	Nil	Nil	Nil	Nil
Total	50	11	36	10

Indian Army.

Northern	25	2	No figures available.
Southern	13	1	
Eastern	8	Nil	
Western	5	1	
Total	51	4	

Report of Far Eastern Commission on Venereal Disease.

Viscountess ASTOR asked the Secretary of State for the Colonies whether he would consider the advisability of submitting to Parliament the report of the Far Eastern Commission of the National Council for Combating Venereal Diseases, including the Commission reports on Hong Kong, Singapore, and Colombo.—Mr. J. H. THOMAS replied: The document in question is not an official report, and its publication is a matter for the National Council for Combating Venereal Diseases. I regret that I should not feel justified in directing its publication at the expense of the State, but I have no doubt that the Council will readily afford facilities to any honourable Members who may wish to peruse the report.

Poor-law Administration.

During the debate on the action of Mr. Wheatley, the Minister of Health, in rescinding the Poplar Order made by Sir A. Mond in 1921, Dr. HADEN GUEST, Parliamentary Private Secretary to the Minister, urged the introduction of a human note into the administration of the Poor-law. There was, he said, every reason for taking children out of the control of the Poor-law and putting them under the control of the education authority. There was every reason for taking the administration of the Poor-law—infirmaries, parish medical services, and so on, and especially the large children's hospitals—out of the control of the Poor-law altogether and using them, with other medical services in the country, to form the basis of a really great public health and medical service. That, he added, could be done.

WEDNESDAY, FEB. 27TH.

Small-pox Cases from 1911 to 1920.

Lieut.-Colonel FREMANTLE asked the Minister of Health the number of cases of small-pox notified on an average for the years 1911 to 1920 and, respectively, in each of the last three years and this year up to date; and the proportion of infant or primary vaccinations to births in each corresponding period, this year excepted.—Mr. GREENWOOD (Parliamentary Secretary to the Ministry of Health) replied: The average number of cases of small-pox notified during the years 1911 to 1920 (civilians only) was 146·3 per year. The numbers of cases notified since 1920 have been as follows: In the year 1921, 315; 1922, 973; 1923, 2486; 1924 (up to Feb. 9th), 478. The figures for 1923 and 1924 are provisional. The proportion of children born during the years 1911 to 1920 who were vaccinated was 45·0 per cent. For 1921 the proportion was 38·3 per cent. The figures for 1922 and 1923 are not yet available.

London School of Hygiene.

Lieut.-Colonel FREMANTLE asked the Minister of Health when the charter of incorporation of the London School of Hygiene, founded through the munificence of the Rockefeller Trustees, would be sealed and published.—Mr. WHEATLEY replied: I hope that the charter of incorporation will be granted in the course of the next few weeks.

Compulsory Vaccination.

Mr. BLACK asked the Minister of Health whether, in view of the fact that in Leicester during 17 years up to the end of 1922 there was not a single death from small-pox, whilst the vaccination rate fell during the same period from 18·3 per cent. to 3·4 per cent., and that for the whole of England and Wales during the same period the total number of deaths had been 255, with a falling vaccination rate of from 73 per cent. to 38·3 per cent., he would bring in a measure to repeal the 1907 Vaccination Act, abolish all compulsion, and leave the question of vaccination to the discretion of the individual citizen.—Mr. WHEATLEY replied: I am considering the present position in regard to vaccination, but I am unable to give any promise to introduce legislation on this subject.

Removal of Advanced Tuberculosis Cases.

Mr. SOMERVILLE HASTINGS asked the Minister of Health whether he could give the number of persons suffering from advanced tuberculosis of the lungs who were living in the same overcrowded homes with, and infecting, their relations; and whether he intended to bring forward legislation for the compulsory removal, if need be, of such persons.—Mr. WHEATLEY replied: I regret that the information asked for in the first part of the question is not available, as regards the second part, this matter will be considered in connexion with any proposals for the amendment of the Public Health Acts.

THURSDAY, FEB. 28TH.

Mental Cases in Prisons.

Mr. STRANGER asked the Under Secretary of State for the Home Department whether he was aware that there were in prisons many inmates mentally and medically unfit confined in observation cells, but in charge only of the ordinary disciplinary officer; and whether, in future, he would arrange to have those men placed in charge of a medical prison orderly instead of a disciplinary officer.—Mr. RHYS DAVIES replied: The number of hospital officers at present available does not admit of this being done in every case, but the Prison Commissioners are making the best arrangements possible within the resources at their disposal and those resources are being steadily improved.

Hostels for Ex-Service Mental Patients.

Sir ELLIS HUME-WILLIAMS asked the Minister of Health (1) whether the hostels recently started for the reception of ex-Service mental patients were entirely distinct and apart from lunatic asylums; whether the hostels were provided with recreation grounds and games; and what medical staff was employed at each. (2) How many hostels, other than asylums, for the reception of ex-Service mental patients had been started, where they were situated, and how many men were now under treatment.—Mr. F. O. ROBERTS replied: Under the existing law I have no power to establish or control institutions for the treatment of pensioners

certified to be insane, except under powers vested in some existing licensee or local authority. As previously announced to the House, the Government has made special arrangements for a selected number of certified cases of a hopeful type likely to make progress under special treatment. Accommodation for 150 such cases is provided at the old manor, Salisbury, and for a further 300 at Kirkburton, a detached block at Storthes Hall Asylum, near Huddersfield. At the former institution there are two medical officers and in the latter three, in addition to the medical superintendent of the main asylum. In both institutions ample facilities are provided for recreation and games, and at the latter there is a welfare officer, whose special duty it is to look after the general welfare of the patients, apart from the purely medical treatment. As regards those mental cases which are not certifiable under the Lunacy Law, it has always been the policy of my department to provide special treatment and accommodation with a view to their complete recovery. To that end, the Ministry have given special training to a number of medical officers and established throughout the country neurological hospitals and clinics where skilled treatment on the most approved modern lines is provided. These efforts have, I am glad to say, met with conspicuous success, for instance, as is shown by returns for a recent quarter, the percentage of those patients discharged recovered or improved is about 70, while in one hospital devoted to the most serious cases, out of 134 patients treated during the year, 68 were discharged recovered, while of the remainder a number had shown considerable improvement. At all these hospitals full provision is made for the recreation, amusement, and occupation of these patients under a welfare officer. These hospitals, numbering 19, are situate at Edenhall, Edinburgh; Shotley Bridge, Gateshead; Oulton Hall, Leeds; Mossley Hill, Lancs; Maghull, near Liverpool; Harrowby Camp, near Grantham; Aston Court, Bristol; Bath; Fernbank, near Roehampton; Ewell, Surrey; Orpington, Surrey; Richmond, Surrey; Sidcup, Kent; Leopardstown, Co. Dublin; Saltash, near Plymouth; Romford, Essex; Craigavon, Belfast; Latchmere, Surrey; Rotherfield Court, Henley-on-Thames. The approximate number of beds is 3024. The number of men under treatment on Jan. 31st was 2772. The total number of medical officers dealing with the treatment of these cases is 67.

Medical Appointments in Prisons.

Sir MURDOCH MACDONALD asked the Under Secretary of State for the Home Department, in view of the opinion of Lord Justice Atkin's Committee on insanity and crime, and of the accompanying memorandum of the Council of the British Medical Association, whether the similar recommendations made by the Departmental Committee on Prisons in April, 1895, to the effect that candidates for medical appointments in prisons should be required to show that they had given special attention to lunacy, had ever been carried out; and would he furnish a return showing the experience in the treatment of insanity before appointments in prisons and criminal asylums.—Mr. RHYS DAVIES replied: When candidates are selected for the appointment of medical officers preference is always given to those who have had some experience of lunacy. Of the 24 whole-time medical officers now serving, 13 had asylum experience, and five had attended students' courses at asylums. As regards posts for part-time medical officers, these are filled by practitioners in the locality and preference is given, wherever possible, to those who have had special experience of lunacy. The medical superintendent of Broadmoor Asylum and his deputy had had asylum experience before their appointment.

Blind Pensioners.

Mr. GILBERT asked the Minister of Pensions the number of blind pensioners pensioned by his department; what was the average pension received by such pensioner; whether, if such pensioner was the inhabitant of a home or hospital for the blind, any deduction was made from the pension; and, if so, what amount.—Mr. F. O. ROBERTS replied: There are 1550 totally blinded officers and men all of whom are receiving pension from my department at the maximum rate. The amount paid in such varies according to rank and family, an unmarried private receiving pension at the rate of 40*s.* a week. Allowances for wives and children of married men are additional. These pensioners are cared for by St. Dunstans (or in Scotland by Newington House), and when they are in either of these institutions they receive allowances at the maximum rate of pension without any deduction.

Medical Examination of Air Force Candidates.

Lieut.-Colonel RUDKIN asked the Under Secretary of State for Air if he was aware that candidates for the Air Force, after they had successfully passed the necessary examinations, were reviewed by the medical authorities, and in some cases rejected; and, in view of the hardship created and the time and money wasted, would he take steps to ensure that the medical examination should be held prior to the written or oral examination.—Mr. LEACH replied: The answer to the first part of the question is in the affirmative. The possibility of holding the medical examination prior to the examination conducted by the Civil Service Commissioners was carefully considered recently, and the conclusion arrived at was that the disadvantages outweighed the advantages. I may add that this opinion was shared by the headmasters who were consulted by the departments. Parents and guardians are strongly recommended in the regulations to have their sons or wards examined by a medical practitioner or by a Royal Air Force preliminary medical board previous to their becoming candidates for commissions in the Royal Air Force, and full details of the medical standards are published in the regulations. If my hon. and gallant friend's question refers to candidates for aircraft-apprenticeships as well as to cadets, I may add that the same reasons for holding the educational examination first are applicable to their case.

TUESDAY, MARCH 4TH.

Harnett v. Bond.

Mr. COSTELLO asked the Prime Minister whether, in view of the evidence given before Mr. Justice Lush and the verdict of the jury and the observations of the learned judge in the case in which a Mr. Harnett was awarded damages amounting to £25,000 against two medical men for causing his confinement as a lunatic, he would without delay appoint a Royal Commission to inquire into the present lunacy laws and their administration, and the conditions under which persons alleged to be insane could under existing regulations be deprived of their personal liberty and confined in asylums or otherwise placed under detention.—Mr. COMYNS-CARR asked the Prime Minister whether his attention had been called to the verdict of the jury and observations of Mr. Justice Lush in the recent case of Harnett *v.* Bond and Adam in the King's Bench Division; and whether a Royal Commission would be appointed forthwith to inquire into the best means of preventing the state of affairs which appeared to prevail with regard to the law and administration relating to lunacy.—Mr. TURNER-SAMUELS asked the Prime Minister whether his attention had been called to the case of Harnett *v.* Bond and another in which on Wednesday a jury found that the defendant's doctors were guilty of wrongly detaining the plaintiff as an inmate of various asylums from Dec. 14th, 1912, to Oct. 15th, 1921, a period of nine years, that the evidence showed that the plaintiff was not of unsound mind on Dec. 14th, 1912, and that during the whole time from then he was fit to be at large; and whether he would immediately have a Royal Commission or other form of inquiry set up to inquire into the administration of the Lunacy Acts in this particular, and especially in regard to the sufficiency of the steps that were taken by the Commissioners in Lunacy and other responsible persons, and the means that were available to an inmate to prevent persons from being detained in lunatic asylums when they ought not to be so detained.—Mr. RAMSAY MACDONALD replied: The proceedings in this case closed as lately as Friday last, and the shorthand notes have only just been received. The Government have not yet had time to give proper consideration to the difficult and complex issues raised, but prima facie it would appear that there is a case for full inquiry, and the Government are fully prepared to consider the setting up of an appropriate body to undertake such an inquiry. I may add that I understand the question of an appeal is under consideration.

Dr. SPERO asked the Under Secretary of State for the Home Department whether, having regard to the verdict of Harnett *v.* Bond and others, and to the damages awarded, his department proposed to accept any responsibility in the matter.—Mr. GREENWOOD replied: I have been asked to reply, and would refer the hon. Member to the answers given by the Prime Minister on this subject.

On the motion for the adjournment of the House, Mr. TURNER-SAMUELS called attention to what he termed the maladministration of the lunacy laws, which, he said, was creating a very definite and scandalous menace to personal liberty. The facts that had recently been revealed in the case of Harnett *v.* Bond proved conclusively that in many cases people who were sane were being immured within the walls of an asylum without having any right to be there at all. There were, of course, urgent and dangerous cases which called for immediate action, but full safeguards should be taken to prevent improper detention. He had personally gone carefully into all the facts connected with certification, discharge, and medical inspection, and he had ample evidence that in every head and department of the administration of the lunacy laws, not only was there neglect but there was also danger to personal liberty. He urged the Government to set up immediately a Royal Commission to look into the bad conditions prevailing in the administration of the lunacy laws.

Mr. GREENWOOD (Parliamentary Secretary to the Ministry of Health) said that the Prime Minister had given a most sympathetic answer to a question that afternoon, and having regard to the fact that an appeal had been lodged, the matter was sub judice. He understood that the appeal might be heard at an early date, after which the Prime Minister would consider the advisability of having the inquiry started at once.

Miners' Phthisis.

Mr. GAVAN-DUFFY asked the Secretary for Mines if he would state what were the terms of reference he had made to the health advisory committee respecting the death of an iron-ore miner named Wilkinson from miners' phthisis; when the members of the health advisory committee were likely to receive the reference which he had made to them; and was he aware that it was now nearly 12 months since any meeting of the health and safety committee of the metalliferous mining industry had been held.—Mr. SHINWELL replied: The facts reported by my hon. friend about the death of Wilkinson were brought before my health advisory committee at their meeting last week, and are being considered by them as part of their general inquiry into dangers from dust. There was no formal reference. I am aware that the Health and Safety Subcommittee of the Metalliferous Advisory Committee has not met for some time; but this has not prevented health questions affecting the industry being dealt with by my health advisory committee, of which the chairman of the subcommittee in question is a member.

Miners' Welfare.

Mr. BATEY asked the Secretary for Mines the total amount paid into the welfare scheme and the total amount paid out for approved schemes; and how many of the approved schemes included pit-head baths.—Mr. SHINWELL replied: The total amount paid into the Miners' Welfare Fund, together with interest on investments, amounted at Feb. 29th, 1924, to £2,608,180 0*s.* 6*d.* The total amounts actually paid out at that date for approved schemes were £837,779 10*s.* 6*d.* from district funds and £60,372 12*s.* 2*d.* from the general fund, but the total amounts allocated to such schemes were about £1,570,500 and £86,000 respectively. The number of approved schemes which include pit-head baths is eight.

Mothers of Weak Intellect.

Mr. G. OLIVER asked the Minister of Health whether, in order to ascertain the magnitude of the question of children born in our Poor-law institutions of mothers of weak intellect, he would issue instructions for the necessary information to be collected.—Mr. WHEATLEY replied: I will consider my hon. friend's suggestion.

The Lister Ward.

Mr. J. BROWN asked the Secretary for Scotland whether, in view of the great interest and value of the Lister ward in the Royal Infirmary of Glasgow, and the strong pleas for its preservation received from all over the world, he would consider the advisability of taking immediate means to ensure that demolition would not be begun until an inquiry could be made.—Mr. ADAMSON replied: I have no authority to intervene in this matter.

KENT AND CANTERBURY HOSPITAL.—The supporters of this hospital have adopted a scheme for collecting subscriptions, known as the Propaganda Committee's Hospital Box Scheme. The third annual meeting of this committee was recently held at Canterbury. The number of honorary representatives, officials, and stewards is over 800, and the subscribers number over 12,000. In order to eliminate the competition of those towns and villages which have to support local hospitals, it is proposed to bring all these institutions under the scheme, and to give patients the choice of hospital, all patients to be paid for by the fund. In order to effect this object representative committees will be appointed in every town and district, controlled by a representative central committee. The annual report states that the total receipts for 1923, including the special ambulance fund, were £6833. On account of box subscriptions they had paid to the hospital £5500, while £258 had been paid direct on account of entertainments, &c. The working expenses totalled £312. On the Ambulance-Garage Fund the total receipts were £885, the cost of the ambulance being £679. The income of the hospital for 1923 was £13,348 and the expenditure £13,289, leaving a credit balance of £59. The number of in-patients admitted during the year was 1483, against 1290 in 1922, and out-patient attendances were 21,918, against 19,905; 736 in-patients were admitted on box subscription certificates, their total cost being £5547. The total cost per head amounted to £7 10*s.* 9*d.* for in-patients and 1*s.* 8*d.* for out-patients.

Appointments.

DUNSCOMBE, N. D., M.B., B.Ch., D.P.H. Camb., L.M.S.S.A., has been appointed Assistant School Medical Officer, Somerset County Council (Bath area).

GILLILAND, H., M.B., Ch.B. Edin., Medical Officer, Staines Workhouse.

St. Thomas's Hospital: HOPE-SIMPSON, J. W., M.B., B.Ch. Camb., YATES, H., M.R.C.S., L.R.C.P. Lond., CREED, R. S., M.B., B.Ch. Oxf., BERRIDGE, W. C. M., M.R.C.S., L.R.C.P. Lond., JEFFERY, A. L. P., M.B., B.S. Lond., WALFORD, A. S. H., M.B., B.Ch. Camb., WEBB-PEPLOE, M. H., M.B., B.Ch. Camb., METCALFE, G. A., M.B., B.Ch. Camb., Casualty Officers and Resident Anæsthetists; DYSON, A. D., M.R.C.S., L.R.C.P. Lond., MURRELL, E. B., M.R.C.S., L.R.C.P. Lond., COOPER, G. K., M.B., B.Ch. Camb., PALMER, H. M., M.R.C.S., L.R.C.P. Lond., Resident House Physicians; STORY, A. G., M.B., B.Ch. Camb., Resident House Physician (for Children); LAUTRÉ, M. A., M.R.C.S., L.R.C.P. Lond., LUPTON, C. A., M.R.C.S., L.R.C.P. Lond., BRIGGS, T. E., M.R.C.S., L.R.C.P. Lond., WILLIAMS, L. G., M.R.C.S., L.R.C.P. Lond., Resident House Surgeons; ALLAN, F. G., M.R.C.S., L.R.C.P. Lond., Resident Orthopædic House Surgeon: PEARCE, T. V., M.B., B.S. Lond., JONES, B. H., M.R.C.S., L.R.C.P. Lond., Resident House Surgeons for Ear and Throat respectively; ALLEN, H. S., M.R.C.S., L.R.C.P. Lond., Senior Obstetric House Physician: CROCKFORD, A. L., M.B., B.Ch. Camb., Junior Obstetric House Physician; PENMAN, G. G., M.R.C.S, L.R.C.P. Lond., Senior Ophthalmic House Surgeon: BATTSON, A. A., M.R.C.S., L.R.C.P. Lond., Junior Ophthalmic House Surgeon; CAVENAGH, J. B., M.B., B.Ch. Oxf., NEILSON, D. F. A., F.R.C.S. Eng., DOYLE, A. F., M.R.C.S., L.R.C.P. Lond., BARRON, H. T., M.D. Lond., FACEY, R. V., M.R.C.S., L.R.C.P. Lond., DOGGART, J. H., M.R.C.S., L.R.C.P. Lond., MARRINER, H. I., F.R.C.S. Edin., JARRATT, W. O. C., M.R.C.S., L.R.C.P. Lond., TURNEY, H. F., M.B., B.Ch. Oxf., COOKE, A. M., M.B., B.Ch. Oxf., WALKER, E. G. L., M.R.C.S., L.R.C.P. Lond., WEAVER-ADAMS, E. R., M.R.C.S., L.R.C.P. Lond., HALLIWELL, C. C., M.R.C.S., L.R.C.P. Lond., MITCHESON, G. F. L., M.B., B.Ch. Oxf., FIRTH, E. K. A., M.R.C.S., L.R.C.P. Lond., DUNN, W. H., M.R.C.S., L.R.C.P. Lond., THORP, K. W., M.R.C.S., L.R.C.P. Lond., STARKEY, R. S., M.R.C.S., L.R.C.P. Lond., STEVENS, A. L. B., M.B., B.Ch. Oxf., DUNN, W. H., M.R.C.S., L.R.C.P. Lond., RICKMAN, J., M.B., B.Ch. Camb., Clinical Assistants.

Certifying Surgeons under the Factory and Workshop Acts: LEWIS, G. M., L.R.C.P. Lond., M.R.C.S. (Peasenhall); HOCKEN, D. F., M.B., B.S. Durh. (St. Blazey); KENNEDY, F. H., M.B., B.S. Durh. (Pershore); ELAM, J. E. (Barnet); ADAM, J. C., M.B., Ch.B. Edin. (Forres).

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, Greenwich, E.—H.S. £150.
Barbados General Hospital.—Jun. Res. S. £250.
Bath Ear, Nose and Throat Hospital, Marlborough Buildings.—Hon. Pathologist.
Bootle Borough Hospital.—Jun. Res. M.O. £125.
Bradford Children's Hospital.—H.S. £125.
Central London Throat, Nose and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. £75.
Charing Cross Hospital, W.C.—Asst. Obstet. P.
Colchester, Essex County Hospital.—Asst. H.S. and Reg. £150.
Colindale Hospital, Hendon, N.W.—Jun. Asst. M.O. £500.
County of London.—Coronership of the Southern District. £1041 6*s.*
County of London Mental Hospitals.—Seventh Asst. M.O.'s. £440.
Doncaster Royal Infirmary and Dispensary.—Jun. H.S. £150.
Dorset Mental Hospital, near Dorchester.—Third Asst. M.O. £350.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—Morning Cas. O. £120.
Evelina Hospital for Children, Southwark, S.E.—H.S. and H.P. Each £160.
Exeter, Royal Devon and Exeter Hospital.—H.P. £150.
Federated Malay States, Central Mental Hospital.—Asst. Med. Supt. £616.
Greenwich, Dreadnought Hospital.—H.S. and H.P. Each £150.
Halifax Royal Infirmary.—Third H.S. £150.
Kensington Dispensary and Children's Hospital, 49, Church-street, W.—R.M.O. £150.
Liverpool, City Seamen's Dispensary.—Asst. Ven. Dis. M.O. £700.
London Lock Hospital, 91 Dean street, W.—H.S. £200.
Maidstone, Kent County Ophthalmic Hospital.—Res. Surg. O. £750.
Manchester, Ancoats Hospital.—R.M.O. £175.
National Hospital for the Paralysed and Epileptic, Queen-square, W.C.—Asst. P.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Res. H.P.'s and H.S.'s. Each £50.
Northampton General Hospital.—H.S. £150.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Pathologist. £300. Also Asst. S.
Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. £250.
Rotherham Hospital.—Jun. H.S. £150.
Royal College of Veterinary Surgeons, 10, Red Lion-square.—Two Examiners.

Royal Ear Hospital, Dean-street, Soho, W.—Hon. Anæsthetist.
Royal Free Hospital, Gray's Inn-road, W.C.—H.S.
Royal Northern Hospital, Holloway, N.—M.O. to Out-Patients. £150.
Royal National Orthopædic Hospital, 234, Gt. Portland-street, W.—H.S. £150.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. £75.
Salford Royal Hospital.—Res. M.O. £175. Three H.S.'s and Cas. H.S. Each £125.
Sheffield Royal Hospital.—Res. Surg. O. £200.
Warrington, Lancashire County Mental Hospital, Winwick.—Asst. M.O. £440.
West Ham Union.—District M.O. £700. Also Res. A.M.O. £350.
West London Hospital, Hammersmith-road, W.—One H.P. and Two H.S.'s. Each £100.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Ayr.

Births, Marriages, and Deaths.

BIRTHS.

LAPAGE.—On March 2nd, at Forest Row, Sussex, the wife of F. Claud Lapage, M.R.C.S., L.R.C.P., of a daughter.
WEBB-JOHNSON.—On Feb. 27th, at "Cricklewood," East Sheen, the wife of Dr. Cecil Webb-Johnson, of a daughter.

DEATHS.

BICKERSTETH.—On Feb. 29th, at Bournemouth, Robert Alexander Bickersteth, F.R.C.S., of Borwick Lodge, Hawkshead, aged 61 years.
CLARK.—On Feb. 26th, at Greenbank, Street, Somerset, Ann Elizabeth Clark, M.D., in her 80th year.
FITZGERALD.—On March 1st, after a long illness, at his residence, Cappawhite, Co. Tipperary, Ireland, Joseph FitzGerald, M.D.
JAMIESON.—On Feb. 27th, at Cromwell-road, S.W., Thomas Hill Jamieson, M.B.E., M.D., M.R.C.P. Edin., aged 50.
REID.—On Feb. 27th, at Okement, Okehampton, Inspector-General Walter Reid, M.D., R.N. (retired), aged 83 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, March 10th.

WAR: at 5 P.M.
Paper:
Flight-Lieutenant H. L. Burton, R.A.F.: Psychomotor Responses in Relation to Flying (with particular reference to an apparatus invented by Flight-Lieutenant G. H. Reid, D.F.C., R.A.F., for Determining Flying Reaction Times).
Demonstration:
Flight-Lieutenant G. H. Reid, D.F.C., R.A.F.: Apparatus for Determining Flying Reaction Times.
To be followed by a discussion.

Tuesday, March 11th.

THERAPEUTICS AND PHARMACOLOGY: At 4.30 P.M.
Paper:
Prof. W. Storm van Leeuwen (Leyden): A theory of Asthma, with special reference to the Influence of Climate.
To be followed by a discussion in which Mr. Frank Coke and others will take part.

PSYCHIATRY: At 8.30 P.M.
Paper:
Dr. Sullivan: The Relation of Alcoholism to Insanity and to Crime.

Wednesday, March 12th.

SPECIAL DISCUSSION: At 5 P.M.
On the Possible Substitutes for Cocaine. Sir William Hale-White (President of the Society) in the chair. Opener: Dr. H. H. Dale. Prof. W. E. Dixon, Prof. C. S. Gibson, Mr. T. B. Layton, Sir Maurice Craig, Mr. Foster Moore, Mr. E. Watson-Williams, and others will also speak.

Thursday, March 13th.

NEUROLOGY: At 8 P.M. (At the National Hospital for the Paralysed and Epileptic, Queen-square, W.C.)
Clinical Meeting.

Friday, March 14th.

CLINICAL: at 5.30 P.M. (Cases at 5 P.M.)
Cases:
Dr. C. F. T. East: Diabetes Insipidus with Unusual Features.
Dr. D. Firth: Congenital Absence of Sternal Portion of Pectoralis Major.
Short Papers:
Dr. T. Stacey Wilson: (1) Three Cases where Nervous Symptoms were due to the Dilatation of the Deep Thigh Veins; (2) Temporary Loss of Memory, similar to that in Double Personality, due to Colon Disturbance.

OPHTHALMOLOGY: At 5 P.M. (At the National Hospital, Queen-square, W.C.)
Clinical Meeting.
Members of the Section have been kindly invited to tea at 4.30 P.M. by the Committee of the Hospital.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.
MONDAY, March 10th.—8.30 P.M., Discussion on the Disturbances of the Nervous System in Hyperpiesia. To be introduced by Dr. Batty Shaw, followed by Sir Humphry Rolleston, Prof. Ernest Starling, Prof. W. Russell, Dr. James Collier, Dr. F. M. R. Walshe, Dr. Geoffrey Evans, and others.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 11th.—5 P.M., Lieut.-Colonel Glen Liston, C.I.E.: The Plague. (First Milroy Lecture.)
THURSDAY.—Second Milroy Lecture.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.
MONDAY, March 10th, to Saturday, March 15th.—BETHLEM ROYAL HOSPITAL. Course in Psychological Medicine: Tues. and Sat., 11 A.M., Dr. Porter Phillips and Dr. Thomas Beaton: Psychoneuroses.—CHELSEA HOSPITAL FOR WOMEN. Daily: Operations, &c.: Mon., 5 P.M., Mr. Rivett: Extra-uterine Gestation; Tues., 2 P.M., Mr. Bonney; Wed., 2 P.M., Mr. Dodd: Ovarian Cysts; Thurs., 9.30 A.M., Mr. Provis: Gonorrhœa in Women: Fri., 2 P.M., Mr. Comyns Berkeley: Carcinoma of the Uterus; Sat., 11 A.M., Mr. Goodwin: Pathological Demonstration.—THE ROYAL FREE HOSPITAL. Wed., 5.30 P.M., Dr. Heald: The Medicinal Uses of Ultra-violet Light.—ROYAL NORTHERN HOSPITAL, in conjunction with the CENTRAL LONDON OPHTHALMIC HOSPITAL, NORTH-EASTERN FEVER HOSPITAL, and ROYAL CHEST HOSPITAL. Special Intensive Course (second week). Further particulars can be obtained from the office 1, Wimpole-street, W. 1.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEBRUARY–MARCH, 1924.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, March 10th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Clinical Types of Paraplegia: Dr. Aldren Turner.
TUESDAY, March 11th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Cerebral Vascular Disease: Dr. Adie.
THURSDAY, March 13th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., The Neuroses: Dr. Hinds Howell.
FRIDAY, March 14th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Neurosyphilis: Dr. James Collier.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, March 10th.—12 noon, Disseminated Sclerosis: Dr. J. G. Greenfield.
The fee for the Course, including Pathology, is £5 5s. For those who hold Perpetual Tickets the fee is £3 3s.

COURSE OF LECTURES ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.
WEDNESDAY, March 12th.—12 noon, Cerebral Cortex: Association Systems.
THURSDAY, March 13th.—12 noon, Sympathetic Nervous System: Dr. Kinnier Wilson.
The fee for this Course will be £2 2s.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, March 12th.—3.30 P.M., Ocular Palsies and Disturbances of Ocular Movement: Mr. Leslie Paton.
The fee for this Course alone is £5 5s. If taken in conjunction with the general Post-Graduate Course the fee is £3 3s. All applications should be sent to the Secretary, Medical School.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

ST. THOMAS'S HOSPITAL, Albert Embankment, S.E.
(In the Governors' Hall.)
THURSDAY, March 13th.—5 P.M., Dr. J. A. Murray: Cancer. (Last Lecture.)

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
THURSDAY, March 13th.—4 P.M., Dr. Still: Abdominal Distension.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, March 12th.—4.30 P.M., Mr. C. E. Shattock: Carcinoma of the Colon.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, March 10th.—10 A.M., Surgical Registrar: Surgical Pathology. 12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen. 2 P.M., Mr. Bishop Harman: Eye Dept.
TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose and Ear Dept. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Pernet: Skin Dept.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10.30 A.M., Dr. Pritchard: Medical Wards. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAYS.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose and Ear.
Daily, 10 A.M. to 6 P.M. Saturdays, 10 A.M. to 1 P.M. In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE. (Prince of Wales's General Hospital.)
(At 4.30 P.M.)
MONDAY, March 10th.—Dr. A. J. Whiting: Sinus Arrhythmia.
TUESDAY.—4 P.M., Mr. J. Howell Evans: Hydrocele.
WEDNESDAY.—Dr. J. Browning Alexander: Pulmonary Emphysema.
THURSDAY.—Mr. H. W. Carson: The Early Diagnosis of Cancer of the Stomach.
FRIDAY.—Dr. C. E. Sundell: Bottle Feeding.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, March 11th.—5 P.M., Dr. Gray: The Tuberculides.
THURSDAY.—5 P.M., Dr. Fox (Chesterfield Lecture): Cutaneous Syphilis.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, March 10th.—(At the Children's Hospital.) Mr. Morrison: The Diagnosis of Chronic Appendicitis in Children.
TUESDAY.—(At the Southern Hospital.) Mr. Douglas-Crawford: Surgical Cases.
WEDNESDAY.—(At the Northern Hospital.) Mr. Rawlinson: Pyelitis.
THURSDAY.—(At the Stanley Hospital.) Dr. Oram: Demonstration of Radiographs.
FRIDAY.—(At the Royal Infirmary.) Mr. Kennon: Surgical Cases.

VICTORIA UNIVERSITY OF MANCHESTER MEDICAL SCHOOL.
FRIDAY, March 14th.—5.30 P.M., Prof. J. C. Brash: The Growth of the Jaws and Palate.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, March 11th.—4.15 P.M., Dr. G. R. Murray: Significance of Changes of Blood Pressure.

MANCHESTER BABIES' HOSPITAL POST-GRADUATE LECTURES.
FRIDAY, March 14th.—5.30 P.M., Dr. Nesta Wells: Infection in Infants' Wards.

SALFORD ROYAL HOSPITAL LECTURES.
THURSDAY, March 13th.—4.30 P.M., Dr. C. E. Jenkins: The Bacteriology of Joint Infections.

UNIVERSITY OF SHEFFIELD POST-GRADUATE LECTURES. (At 3.30 P.M.)
FRIDAY, March 14th. (At the Royal Hospital.)—Mr. Townrow: Demonstrations of Oral Cases.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, March 12th.—4 P.M., Dr. G. B. Dixon: Some Aspects of the Tuberculosis Problem in an Industrial City.

THE LANCET: SUBSCRIPTION RATES.

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	Six Months	1 1 0
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ABROAD	One Year	2 10 0
	Six Months	1 5 0
	Three Months	0 12 6

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Notes, Comments, and Abstracts.

WHERE DOES MENTAL HYGIENE BEGIN? *

AN AMERICAN VIEW.

BY L. VERNON BRIGGS, M.D. RICHMOND, VA.,
DIRECTOR OF THE MASSACHUSETTS SOCIETY FOR MENTAL HYGIENE.

ONLY two decades ago we were all working for the better housing of the mentally ill and for humane care of them both inside and outside institutions. We then felt that this was all that we could ask for them, and its accomplishment was a great step forward. Conditions in many institutions—overcrowded as they were—savoured more of the prison than of the hospital. The meagre staffs were only able to look after physical ills called to their attention by ward nurses or by patients themselves. The majority of patients only saw the physician as he passed hurriedly through the wards in which they spent their days and nights. In some of the hospitals no occupation was known other than the polishing of floors and ward, and kitchen work which had no therapeutic value. Exercise in the open consisted of a walk around the grounds under the direction of attendants, the patients being strung out in files. The staffs did little, if any, scientific work, in most of the hospitals, and few hospitals had a laboratory. Operations which had to be performed by visiting surgeons necessitated bringing the patient into one of the ward rooms or doctors' offices, where tin pails and vegetable pans were used for sterilising the instruments over ordinary stoves. This state of affairs persisted as late as 1912.

Outside the institutions the mentally ill received little consideration. Taken from their homes, from boarding places, or from the street when they showed signs of mental aberration, they were thrust into police stations or city gaols and there kept, often for days, before being transferred to a hospital and treated as sick individuals. This condition also obtained in Massachusetts until 1912. So the first step for a generation towards the really humane care of the mentally ill, which was then the height of our ambition, was only reached a decade ago.

Psychopathic Hospital Idea.

The psychopathic hospital idea in this country started as early as 1906 with the Psychopathic Hospital at the University of Michigan. Prior to this an observation ward was established in 1890 in the Philadelphia Hospital, and about the same time Dr. Adolph Meyer developed an observation department in his hospital at Kankakee, Ill. In 1896 the Psychiatric Institute on Ward's Island, N.Y., was established, and under Dr. Meyer psychiatric wards were opened in connexion with the Institute in 1902. Bellevue Hospital and Kings County Hospital in New York also had wards for psychiatric cases. Following the establishment of the Psychopathic Hospital at the University of Michigan in 1906, there was established in 1912 a psychopathic hospital in Boston, at first a department of the Boston State Hospital but since made an independent unit. The following year, 1913, the Phipps Psychiatric Clinic was started at Baltimore under Dr. Meyer, in connexion with the Johns Hopkins Hospital Medical School and Hospital. With the psychopathic hospital idea came more scientific care and treatment within the institutions, although little progress was made outside of institutions or in the community. Pathological laboratories were established in many of our State hospitals and in our general hospitals scientific studies were made of mental disease; but there was no centre of scientific research or direction until the psychopathic hospital idea was established, when another very important objective was reached.

Social Service.

With the establishment of the psychopathic hospital idea came social service. In Massachusetts, following the lead of Richard Cabot with his social service as a part of the Massachusetts General Hospital out-patient department, the Boston Dispensary established a similar service, and there the first social service workers were trained in mental clinics. Comparative statistics for three months without, and for three months with, social workers in the mental clinic of the Boston Dispensary showed that that service prevented the commitment of many early cases by following up early mental treatment, as directed by physicians, and obtaining results beyond the routine treatment of clinical service, and by improving social conditions, thus preventing

* Read at a Conference of Social Work, held at Stamford, Conn., U.S.A.

other members of the same family or of the locality from similar breakdowns. Social service after-care also prevented the return to the hospitals for the insane of many discharged cases. Social case work, follow-up work, research work, educational work were the functions outlined by Miss Hannah Curtis for the social service. So important has this work become that there is now a Training School for Social Workers at Smith College in Northampton, an institution of which the success is established. The requirements are two summers of study at Northampton and nine months of practice in some social agency or hospital social service under the school's supervision—a total course of 13 months. The graduates are prepared for various branches of social case work and community service, especially in psychiatric cases.

Out-patient Clinics.

With the beginning of the better care of the mentally ill two decades ago, there was established an out-patient clinic at the Boston Dispensary for mental cases. There was also a neurological clinic; the staffs of these clinics referred cases to each other, but worked separately. It was my privilege to be elected head of the mental out-patient clinic at the dispensary soon after it was established in 1899, which position I held until 1912, when I became a member of the State Board of Insanity.

Social workers trained in the mental department at the Boston Dispensary proved a valuable aid to the physicians and a blessing to the patients; it revealed the patient's environment, which was often the cause of his breakdown; social agencies soon learned to refer to the mental clinic many cases which heretofore they had not been able to help. With the opening of the Psychopathic Hospital in Boston and the establishment of its out-patient clinic a good deal of the work done at the dispensary was transferred there, which greatly broadened the field, for the Psychopathic Hospital soon took cases from the courts and also from agencies outside of the city. Thus what is now known as mental hygiene began in Massachusetts two decades ago; out-patient departments for mental cases increased so fast that within a little over ten years there were nearly 40 functioning in the State of Massachusetts, and this number has been maintained to the present time.

Education in Mental Hygiene.

The spread of the psychopathic hospital idea and its influence on the community soon began to be felt. The community was becoming educated in mental hygiene. Its influence in court procedure was first made manifest in the establishment of Dr. W. Healy's work in the courts of Chicago in 1909 with delinquent and psychopathic individuals, especially children. This influence has spread to many courts throughout our country, from Boston to Seattle, where to-day one may obtain a liberal education in mental hygiene. With the establishment of the industrial accident boards, mental hygiene became a factor in industry. Many large firms and corporations employ nurses and doctors to instruct their employees in mental hygiene and also to detect the first symptoms of nervous and mental breakdown, correct them, or direct these patients into channels where they may receive early treatment.

Another progressive step taken in mental hygiene tending towards prevention was its introduction into the schools and the application of its teachings. Massachusetts passed a law in 1919 whereby school physicians and school nurses, properly trained, were to be employed for the purpose of studying, assisting, or treating children whose backwardness or delinquency showed they needed special instruction, medical care, or a change in their environments. Teachers are now directed to report to the school physician or school psychiatrist the names of pupils who are backward or show abnormality in their work in any direction, and also of the true delinquent. Psychiatrists then make special examinations and the nurse visits the home.

In order to prevent these children from keeping others back special classes are formed for them. Teachers experienced in the instruction of retarded minds develop these children at least to the point of taking care of themselves, if possible; for the first time in history such children have a fair chance, for they stood no chance whatever when competing with children who had been endowed with much greater powers of assimilating knowledge.

It soon developed that many of the causes of backwardness could be removed if intelligently handled and scientifically treated. Environmental conditions at home, bad habits, glandular difficulties, improper or insufficient feeding—one or several of these often affecting the same child—when removed or cured, enabled that child to take its place in the school and in the world.

So it was in the courts. The child who had been brought into the municipal courts charged with destroying property, or setting fires, with bad habits or being stubborn, or perhaps guilty of petty stealing, sometimes taught by his father or mother, and who had never had an opportunity of knowing right from wrong, was set right, and often made into a valuable citizen, as the result of Dr. Healy's work and, later, of the work of other psychiatrists appointed to the courts. Mental hygiene, which began a few years ago with the child in school and with the early delinquent, has gone a step further and now is to begin with the baby.

Education of the Very Young.

Dr. Douglas A. Thom has organised clinics in Boston with a view to correcting habit formation in babies and very young children, and also ascertaining the cause of any convulsions or other abnormal phenomena which may be observed by those in charge of these babies in the hospitals and in the community. He says, in relation to the behaviour problem of the nervous child, that many of these conditions can be traced to a failure on the part of the individual to adapt himself to his environment, even in the years of childhood, and that we are beginning to feel that more and more frequently the individual is the victim of his environment rather than of his heredity. It is not unreasonable to presume that if there is a group of cases belonging to the economic and social failures which have their beginning in the mental conflicts of childhood, and these conflicts can be discovered at 5 years instead of 13, much will have been accomplished for the child and for all those with whom he is to come in contact. There are certain fundamentals necessary to the mental development of every human being that are more in evidence during childhood that in any other period of life. Those of particular importance because of their utility are: plasticity, suggestibility, imitativeness, and love of approbation. It has been figuratively stated in one way or another that man is extremely complex—that he has very great capacity for modification, and that his period of mobility lasts longer than in other animals. Thus the plasticity of the early years of life should be utilised to its limit in an effort to develop habits which will later serve the individual in good stead.

Not only is it important to study the material with which we are dealing, so far as the child is concerned, but it is quite necessary to know by whom, and under what conditions, this material is being used. The immediate environment, the home and its occupants and surroundings are what go to make up the mental atmosphere in which the child lives.

Education of the Mother.

Much of the child's early life is, or should be, spent with the mother. Her influence cannot be over-estimated, but all too frequently it is not as healthy as we might hope. The mother may be worn out by household cares; she may be striving to supplement the family budget by a few hours of work outside, when she should be resting or in bed; or she may be pleasure-loving, avoiding her duty, having turned her responsibility over to the nursemaid for so many pieces of silver.

Again, we may find that a mother with the most excellent intentions may be over-solicitous. Too frequently she is emotionally unstable; what is condoned to-day may be punished to-morrow; and in spite of ability to adjust rapidly, the child finds it difficult or impossible to follow a consistent line of conduct. There is no situation so pathetic for both mother and child as that of the mentally defective mother who is doing her best, yet failing, and recognising her own failures.

In order to ascertain just what the home situation is and what factors are to be utilised or combated, a trained social worker is employed to make investigation and to see that the doctor's directions are fully understood and are being carried out. It is important not to make mere interviews out of these visits, but to use workers who are not afraid to get down to the social and intellectual level of their hostess, as far as possible. The factors which are likely to contaminate the mental atmosphere of the child can frequently be determined in this way and referred for advice and assistance to the doctor, minister, teacher, social agency, or whatever source to which it seems advisable to turn.

Dr. Thom, feeling that the foregoing principles might be utilised to advantage, has organised "habit clinics" in connexion with the Baby Hygiene Association, to deal with those children who in the pre-school age—that is, between 2 and 5—are developing undesirable habits, and to determine, in so far as possible, the basis of these habits and to institute measures which will tend toward their correction.

Mental hygiene should be inculcated as soon as the child is capable of forming habits, when any abnormal, physical, or mental symptoms appear. The attack on mental disease at this early period, and the following of it through the schools with scientific purpose will, it is hoped, result in our not being called upon to build as many "monuments of resignation," as the State hospitals have been called, for housing and feeding thousands of hopeless derelicts, who represent an immeasurable loss of intelligence to the community. But, as Dr. Thom says, the existence of clinics for children of pre-school age do not require justification.

No claim is here made that there is any relation between the undesirable habits of childhood and psychoses of later life; yet it is not difficult to see how closely these infantile reactions resemble the psycho-neurotic manifestations of adult life, and that a fundamental lack of inhibitions may be a dominating characteristic in a criminal career.

STERILISATION OF RUBBER GLOVES.

Dr. W. Lutzmoer, of Werro, in Estland, writes to *Ars Medici* (1924, ii., 42) to recommend, as a result of nine years' experience, the following method of sterilising rubber gloves: "Put on the perfectly sound unsterilised gloves, and wash the gloved hands with soft soap and water once or twice, then smear the gloves carefully with the following solution, which should be poured liberally on a swab—Rp. iodi puri 2·0 gm., spiritus vini (70 per cent.) 200·0. With this method I have even with laparotomy never seen fever or infection, besides which the gloves last a very long time."

CIVIL SERVICE BONUS.

THE Ministry of Health, in a circular (No. 477) dated Feb. 28th, has informed local authorities that the review on March 1st of Civil Service bonus will be on the basis of an average cost of living figure of 80—i.e., on the same basis as obtained during the six months commencing March 1st, 1923. In the case of salaries over £500 a year the bonus will still be subject to the special percentage deductions specified in 1921. In view of the increase of this bonus the range within which bonus may be paid by local authorities to those of their officers whose remuneration is subject to the Minister's sanction is correspondingly increased.

"POPULAR FALLACIES EXPLAINED AND CORRECTED."

Mr. A. S. E. Ackermann, B.Sc., has spent some 22 years in collecting the material for this book, now in its third edition, in which 1350 popular ?allacies are subjected to scientific scrutiny and thereby refuted. The subject-matter, divided into 25 fields of error, comprises nearly the whole domain of human knowledge, from football to astronomy. The author has taken great pains to obtain his information from specialists and authoritative sources, to which he adds touches of humour in many instances. The section entitled "Ourselves" deals with popular misconceptions as regards our bodies and our diseases, and should prove of interest and value to the practitioner who finds himself faced with age-old superstition or modern pseudoc-scientific notions in the course of his ministrations. The book, which is published by the Old Westminster Press at 12*s.* 6*d.*, is well annotated, and contains a preface by Sir Richard Gregory, D.Sc. F.R.A.S. An excellent addition to the reference shelves.

THE DIARY OF A FIELD AMBULANCE.

WE have received a little volume[1] which is a kind o *journal intime* of the 44th Field Ambulance, contributed to by all ranks, and gives perhaps a truer picture of the real life of the army than many more pretentious official histories. It touches lightly on matters of strategy, and adds but little to medical knowledge, but it does succeed in conveying a vivid impression of the life of a divisional medical unit, and of the joys and sorrows of the men who bore the burden and heat of the day. The 44th Field Ambulance was a unit with a very highly developed esprit de corps—"We were, after all, just one large family, and the loss of one after another struck hard at us." It was this spirit which helped them to win a tribute from two infantry commanding officers of the 14th Division during the Battle of the Somme—"At all times officers and men of the 44th Field Ambulance loyally answered to the very many calls made upon them, and carried out their work under heavy fire, regardless of personal danger."

The history of the unit is traced from its formation at Aldershot in September, 1914, its training, its embarkation for France in May, 1915, and through the various battles in which it took part with the 14th Division—"the first unit of the new army to be seriously engaged." Ypres, Hooge, Sanctuary Wood, Arras, the Somme, Telegraph Hill, Glencorse Wood, Inverness Copse, Passchendale, St. Quentin, and the dark days of 1918, Messines and the final Flanders offensive, all tell the tale of its activities. The list of killed and wounded and the record of honours won make an impressive tribute to the work done by a small unit (one of many such), less than a company of infantry in size, and there are many moving passages in the book. Besides this, however, there is a light-hearted, almost impish record of amusing incidents in the unit's career, and sport has quite a considerable share in the chronicle. "Jerry lost the war by concentrating on such silly things as Hymns of Hate. We won it by playing and laughing and doing things in the spirit of the 18th Londons when they dribbled their football across No Man's Land in the attack on Loos." In the creation and functioning of such units as this the Army Medical Service achieved a triumph of organisation of which it can be justly proud.

The volume is illustrated with photographs, plans and some delightful pen-and-ink sketches, and there is a very interesting diagram showing the method of evacuation of wounded from the front line to the base. It is altogether a book which should appeal to everyone who took part in the medical services during the war, particularly those who served in similar units, and the 44th Field Ambulance is to be congratulated on its enterprise in compiling this excellently produced record.

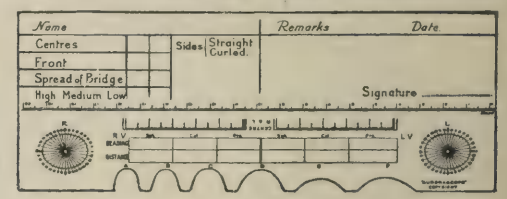
[1] With the Forty-Fourths. Being a Record of the Doings of the 44th Field Ambulance (14th Division). London: Spottiswoode, Ballantyne and Co. Pp. 83. 5*s.*

BAYER "205" AND FOURNEAU "309."

ALTHOUGH nothing definite has yet been announced regarding the composition of Bayer "205," an approximate graphic formula appeared in the *British Medical Journal* of Sept. 23rd, 1922. The *Journal* of the Society of Chemical Industry for Feb. 29th now calls attention to the probable identity of Bayer "205" and Fourneau "309." The latter is said to be a symmetrical urea of meta-amino-benzoyl-meta-amino-paramethylbenzoyl 1-naphthylamine-4.6.8-trisulphonate of sodium. This formula closely resembles that given by Dr. H. King in the annual report of the Medical Research Council for 1921.

AN OCULIST'S FRAME-FITTING PRESCRIPTION CARD.

A DIFFICULTY confronting the general practitioner is to have a ready and easy system of giving instructions to the optician in the matter of supplying properly fitting spectacles. This is important in prescribing astigmatic, bi-focal lenses, &c., which, if ill-fitting, often distort the vision, irritate the patient, and defeat the object of even the best corrections. It applies to the general practitioner who, perhaps, living far away in the country or the Colonies, has taken up refraction work. I have devised a simple Frame-fitting and Prescription Card (see figure) which, when doubled on itself,



gives a measurement of 8 in. long and 1½ in. broad, marked as is customary with opticians, in millimetre scale. The lower section shows a series of usual standard fittings of the bridge of the nose, marked A, B, C, D, E, F. The corrected vision being determined and the axis of the cylinders recorded, the bridge of the nose is measured by fitting on the semi-oval cut-outs, the size being determined according to the letter A, B, C, D, E, or F. Further, a statement as to the height of the bridge is suggested such as *high*, *medium*, or *low*, and is noted on the upper section of the prescription card. To mark off the optical centres (a most important point) the card, folded on itself, showing two oblong spaces, right and left, is placed on the eyebrows, the patient being directed to look straight in front and the pupillary centre is recorded on this special space by the mark X. The final step is to note the width of the forehead or front on the long measured scale. In carrying out the proceedings suggested, no numerical calculations are necessary and no special skill is required. It is not intended that the work of the optician should be usurped, but their services are frequently out of reach of their would-be clients.

The cards have been made for me by the Aurorascope Co., Ltd., Fulwood House, Fulwood-place, Holborn, W.C.

London, W. HENRY DUTCH, M.R.C.S. Eng.

LEEDS WORKPEOPLE'S HOSPITAL FUND.

THE thirty-seventh annual report shows an income of £37,639 for 1923, an increase of £4462, compared with 1922. Workshops—the main source of the income—showed an income of £2539, the workshop contributions in 1923 reaching £27,839. Apart from the maintenance of the convalescent home—a balance of over £28,000 was available for distribution among the local medical charities. Of this sum the Leeds General Infirmary received £18,000, the Public Dispensary and Hospital for Women and Children each £2500, the Maternity Hospital £900, and smaller institutions less sums in proportion.

The Relationship OF SOME HÆMOLYTIC DISORDERS TO PERNICIOUS ANÆMIA.

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THE object of this paper, which is supplementary to one previously published by us in THE LANCET,[1,2] is to call attention to some examples of obscure hæmolytic disorders and to discuss their relationship to pernicious anæmia. Some of them present rare and hitherto almost undescribed conditions. All appear to have the common factor of internal hæmolysis, but since they differ in other respects we present them in a short series of small groups.

EVIDENCE OF INTERNAL HÆMOLYSIS IN PERNICIOUS ANÆMIA.

It is important at this stage to state the evidence on which we assume that internal hæmolysis takes place in pernicious anæmia and the morbid states we are about to consider. We realise that as yet proof of internal hæmolysis in pernicious anæmia does not rest on an entirely satisfactory basis and we hope later to put it to experimental test; but for the present we accept it as a working hypothesis.

The generally accepted evidence for this view is the serious diminution of red cells, in the absence of external blood loss, associated with signs of greatly increased red cell formation as shown by hyperplasia of the red marrow and the presence of abnormal and immature red cells in the peripheral circulation. Additional evidence is afforded by increased pigment excretion in the urine, coloration of the blood serum, the deposition of free iron in the viscera, splenic enlargement, and red-cell phagocytosis. The interpretation of these data as evidence of internal hæmolysis has received some experimental support. Bunting [3] found that in rabbits anæmia secondary to severe and repeated hæmorrhages was accompanied by the blood and bone marrow picture of secondary anæmia, but that if the circulating red cells were attacked by a hæmolytic toxin, ricin, or saponin, the changes produced in the blood and red marrow were similar to those of pernicious anæmia. Bunting favoured the view that the circulating toxin acted upon both the red cells and the marrow. McMaster [9] and Haessler, however, found that if rabbits were repeatedly bled and at the same time given subcutaneous injections of hæmoglobin the resultant anæmia was accompanied by marked proliferation of the red marrow, and they concluded that the factor determining this proliferation was the presence in the body of hæmoglobin, or its precursors, in excess of the amount which could be utilised by the marrow already existing.

CLINICAL CASES.

First Group.

The first group of cases comprises two, the main features of which are the blood changes of pernicious anæmia, jaundice, and hæmoglobinuria.

CASE 1.—A dock labourer, aged 33, became an in-patient at the London Hospital in December, 1905. Two years and eight months previously he had begun to feel tired and languid, and five months previously had passed what he took to be blood in his urine. This apparent hæmaturia was repeated a few days later, and he was admitted to St. Bartholomew's Hospital, where a diagnosis of "jaundice and hæmoglobinuria" was made. The hæmoglobinuria soon ceased and the patient, having improved, was discharged. About three months later his weakness returned and he was admitted to the London Hospital. On examination the skin was lemon-tinted, the spleen was felt three fingers-breadth below the costal margin, and his temperature was raised to between 101° and 103° F.; there was marked pyorrhœa and no wasting. Whilst in hospital the patient had an attack of hæmoglobinuria with no relation to cold, which was followed by sudden pain in the chest and hæmoptysis suggestive of pulmonary infarction. This again was followed by thrombosis in the right posterior tibial and left internal saphenous veins. During the following three to four years this patient was admitted to the London Hospital altogether on five occasions. During the intervals between the admissions he returned to his work. In February, 1909, he was seen by one of us for the first time and his blood on examination gave the following readings: Red cells 1,321,000 per c.mm., colour index 0·9, marked morphological changes in the red cells with numerous megaloblasts and a relative lymphocytosis. The patient was obviously jaundiced and the serum contained bile pigment. The urine was of a port-wine colour with a deposit of golden-brown pigment and hæmolysed red cells, and showed the spectrum of oxyhæmoglobin. The Wassermann reaction (W.R.) was negative.

This patient was examined by one of us on several occasions during his remissions and while engaged upon his work as a dock labourer. During all this time he was strikingly anæmic, with a hæmoglobin percentage of about 20. Admitted for the last time in January, 1910, with a sore throat and an exacerabtion of oral sepsis, his general condition and blood state were found to be much the same. But acute septicæmia developed and the patient died. Post mortem, the characteristic changes of pernicious anæmia were found in addition to those of acute sepsis.

CASE 2.—A bricklayer, aged 38, was admitted with an apparently similar condition into the London Hospital in June, 1918. He gave an eleven years' history of anæmia and eight years' history of periodic attacks of hæmoglobinuria, which occurred without exposure to cold. Examined on admission, this patient was a well-developed muscular man, very anæmic and slightly jaundiced; he stated that he became jaundiced whenever his urine became red, which occurred about once every four to eight weeks. The spleen was not palpable. Whilst in hospital he developed thrombosis of his right median basilic and cephalic veins. His urine contained hæmoglobin and granular casts, but no red cells. No attack of severe hæmoglobinuria occurred during his stay in hospital. The serum was tinged with bile, and examination of the blood gave the following readings: Red cells 1,150,000 per c.mm., colour index 0·9, marked morphological changes in the red cells with many megaloblasts; there was also a leucopenia of 2600 cells per c.mm. with a relative lymphocytosis. The fragility of the red cells was normal and the W.R. negative. This patient was discharged after a month's stay in hospital and died two years later, after constant ill-health and inability to do any work. No post-mortem examination was carried out.

It is evident that these two patients were strikingly similar, in that they were males of about the same age with a clinical condition and blood state suggestive of pernicious anæmia, but differing from it in the following points: The occurrence of attacks of hæmoglobinuria and thrombus formation in superficial veins, the presence of marked jaundice, which is a very rare event in pernicious anæmia, and the long duration of the illness, 8 years and 13 years respectively.

The question arises as to the category in which these two cases are to be placed. Are they examples of so-called paroxysmal hæmoglobinuria or of pernicious anæmia with hæmoglobinuria? With regard to the first alternative, it has been our experience that in paroxysmal hæmoglobinuria, alterations in the blood count other than those of a possible slight secondary anæmia are not found. With regard to the second alternative, the history and clinical state in these two cases differed, as has just been mentioned, from those in pernicious anæmia, and further the occurrence of hæmoglobinuria in this disorder is extremely rare; we have been able to find in the literature only one reference [8] to its presence, although Minot [10] refers to it as occurring occasionally.

There is a third possibility. Are these two patients examples of the acquired form of hæmolytic icterus with hæmoglobinuria occurring during the hæmolytic phases? Various examples of this condition have been recorded, and lately Giffin [4] has described under

the title of "Hæmoglobinuria in Hæmolytic Jaundice" a case which resembles to a considerable extent the two cases we have described above. Giffin considered his case, a woman of 32, to be an example of hæmolytic jaundice, but in the absence of splenic enlargement or of any familial history of the condition the diagnosis rested mainly on two estimations of the red cell fragility. On both occasions hæmolysis commenced at 0·5 per cent. saline as contrasted with a normal at 0·42 per cent. The red cell changes resembled those of pernicious anæmia. We should consider the red cell fragility in Giffin's case as less marked than is the rule in typical examples of hæmolytic icterus, and the same criticism applies to other cases quoted by Giffin in his article. In one of our cases in which the fragility was examined it was found to be normal. We revert later to the relationship between pernicious anæmia and hæmolytic icterus, as well as to the difficulty in distinguishing between occasional atypical cases which appear to occupy a position intermediate between the two conditions. For the present we prefer to place the two cases here described in a separate category.

The difference, however, between this condition and pernicious anæmia is apparently one of degree only, the phases of slow blood destruction responsible for the relapses of pernicious anæmia being accentuated by short sharp bursts of blood destruction in which the quantity of hæmoglobin liberated is so large that it is excreted as such in the urine.

Second Group.

The second group of cases concerns two subjects of arseniuretted hydrogen gas poisoning observed by us. AsH_3 is a well-recognised agent of internal hæmolysis and there was no doubt as to the diagnosis in these cases, but they are included here because of the strong clinical resemblance which they bear to the preceding group.

CASES 3 and 4.—Two men employed in a chemical works, their duty being to supervise a mixture of zinc and sulphuric acid in an open vessel. Both these materials were subsequently found to contain arsenic, which in the sulphuric acid amounted to 0·066 per cent. Shortly after leaving work on one occasion both men had sudden epigastric pain, vomited, and passed urine like blood. On examination two days later they were found to be drowsy, delirious, markedly jaundiced, and profoundly anæmic. The urine contained a large amount of hæmoglobin. The blood showed the red cell and hæmoglobin changes of pernicious anæmia, both normoblasts and megaloblasts being present. Bile pigment was present in the blood, but not in the urine. Both patients made a rapid and uneventful recovery. On admission they stated that they were employed at a lead works, but the association of jaundice, anæmia of the primary type, and hæmoglobinuria was sufficiently indicative of the cause of their condition.

Such cases, though well known to occur, are rarely met with in the practice of the London Hospital. They serve as a valuable object-lesson of the effect of inhaling a powerful and rapidly acting hæmolytic poison.

Third Group.

The third group is represented by one case, the detailed account of which is in course of publication by one of us in conjunction with Dr. J. H. Sequeira. We give an outline of the more important points.

CASE 5.—A butcher, aged 32, first seen by one of us in 1910, giving one year's history of skin irritation, worse on exposure to cold, and six months' history of a rash and loss of hair. On admission to the London Hospital the skin of the limbs and trunk was black, the colour of a negro's. The face and hands were a dark yellowish brown. The patient was quite bald. The blood state was that of pernicious anæmia with 1,530,000 red cells per c.mm., hæmoglobin 28 per cent., and colour index 0·9. Numerous normoblasts and megaloblasts were present. The urine was normal and, with the exception of well-marked oral sepsis, no other physical signs of disease were found. Previous to this illness the patient described himself as a perfectly healthy man. No drugs, such as arsenic or silver, had been given him by his doctor. The patient was given arsacetin, and during the next month his blood condition was that of an improving case of pernicious anæmia. The blood continued to improve, but reverted to the secondary anæmic type, the count four months later being 4,350,000 red cells per c.mm., with a colour index of 0·5 and very occasional normoblasts were found. During this period the colour of the skin became markedly lighter.

The patient was readmitted for observation in 1921 and again in 1922. Since 1910 he has suffered from anæmia to a degree which has prevented him from following his occupation. His appearance has entirely altered and he does not suffer from any skin irritation. He may now be described as a grey-haired lemon-tinted man. In 1921 his blood showed a severe anæmia with a low colour index of about 0·5 and numerous normoblasts on several examinations. In 1922 the colour index was again usually low but varied (0·27 to 0·71), and the red cell changes were extreme. On one occasion 322 normoblasts and 13 megaloblasts were seen while counting 200 leucocytes (white cells 5800 per c.mm.) The patient is still alive and apparently in much the same condition.

We would describe this man as an example of severe internal hæmolysis of very long duration—from 1910 to 1923—in which the broken-down blood pigment instead of being deposited in the internal viscera as in pernicious anæmia, or voided in the urine as in the previous group of cases, is stored in the skin—at any rate in part. This abnormality in pigment distribution is associated with a hæmolytic process of extreme chronicity suggesting that we are considering here a condition allied to, but differing from, pernicious anæmia.

The syndrome exemplified by this patient appears to be of great rarity and unlike that of hæmochromatosis associated with diabetes. Mosse,[11] in a paper dealing with melanosis of the skin in pernicious anæmia, recently described a somewhat similar case in a woman, but in his case, which was of an acute type, he came to the conclusion that the pigmentation was arsenical. In Case 5 arsenic as a cause was investigated and excluded.

Fourth Group.

The fourth group comprises a variety of conditions usually classified under the term of "paroxysmal hæmoglobinuria." We describe here two examples only:—

CASE 6.—A wood carver, aged 17 years, was admitted to the London Hospital in 1912 with a six months' history of pain in the back and a seven weeks' history of "blood" in the urine appearing only after exercise and disappearing when he lay down. The urine passed by the patient when lying down was perfectly normal, but after he stood up it contained a heavy cloud of albumin. After he took half an hour's walk it became claret-coloured, gave a marked guaiac reaction, presented the spectrum of oxyhæmoglobin, and deposited a heavy sediment of broken-up red cells. The patient's serum was of normal colour in the intervals between the attacks, but during the attacks was faintly tinged with hæmoglobin. The sequence of events leading up to hæmoglobinuria did not seem to be in any way dependent upon exposure to cold, but was proved on several occasions to follow upon exertion. The erect posture led to the passage of albumin, mild walking exercise to a mild degree of hæmoglobinuria, and more strenuous walking exercise to severe hæmoglobinuria with the passage of porter-coloured urine. The W.R. was tested on several occasions and was either negative or incompletely so. The boy had no other physical signs of disease and no stigmata of congenital syphilis. The blood count showed a mild degree of anæmia with a slight inflammatory leucocytosis. The patient was given 10 c.cm. of horse serum subcutaneously and the following day walked for two miles. His urine at the end remained clear and free from albumin. Three days later the hæmoglobinuria returned after exercise and 10 c.cm. more serum was given. The urine again remained clear after exercise, but after a period the patient relapsed again. Four injections of horse serum were given altogether, and after the final injection the patient was observed over a period of several weeks, during which he took sufficient walking exercise to wear out his boots, and except for the very occasional presence of a slight amount of albumin the urine remained normal. No further treatment had been given, and now, 11 years later, the patient is perfectly well and has been free from attacks in the interval.

The points of interest in this case are the suggested relationship between the postural albuminuria of adolescence and paroxysmal hæmoglobinuria, the definite dependence of the attack upon exercise and not upon exposure to cold, the probable absence of a syphilitic origin, and the cure, first temporary and finally complete, consequent upon the injection of horse serum.

The second example of the fourth group is described mainly as a contrast to the first.

CASE 7.—A Jew, aged 40, was quite well up to the age of 31, when he married; during his honeymoon he passed "blood" in his urine for the first time. He had several mild attacks of this nature and five years later, after bathing, he got a severe attack of hæmoglobinuria, followed by deep jaundice which lasted for several days. During the next four years he experienced numerous severe attacks of the same nature and always after exposure to cold. On examination during an attack his urine was the colour of porter, and contained methæmoglobin and the débris of red cells. He was deeply jaundiced and his serum was strongly bile-tinged. His blood showed a very mild degree of anæmia with a slight inflammatory leucocytosis and the fragility of his red cells was normal. He denied syphilitic infection, but his W.R. was unfortunately not obtained. Treatment with horse serum had no beneficial effect.

This man presented the more usual type of hæmoglobinuria definitely associated with exposure to cold in contrast to the previous case in which the attacks followed exercise in the erect posture. Case 6 was given horse serum on the supposition that some inhibitory substance, which might in normal man prevent the possible hæmolytic action of the chemical products of muscular activity, was absent in his case. Whether the supposition was right or wrong the result of giving the horse serum was dramatically successful. In Case 7 the serum was quite ineffective.

Paroxysmal hæmoglobinuria is defined by Chester [7] and Basil Jones as "a chronic disease, due to syphilitic infection, manifesting itself in recurrent paroxysms of hæmoglobinuria and in characteristic constitutional symptoms. The blood of patients who suffer with this disease contains in latent form a specific hæmolysin which becomes active when the blood is chilled and produces the attacks." In a recent article Hannema[5] and Rytma have described the reaction of Donarth and Landsteiner by which hæmolysis is brought about on exposure of the red cells to ice-box temperature. They also mention the experiments of Hymans van der Bergh and Hymans showing the influence of a carbonic acid gas atmosphere in favouring hæmolysis, and the later work of Widal, Abram, and Brissaud on the mechanism of the hæmolytic process in paroxysmal hæmoglobinuria.

But while something has been learnt of the hæmolytic process in these rare states, it is probable, and the two cases which we describe strengthen the probability, that the agent involved may vary in the different cases met with and that the underlying syphilitic factor may not be constant. However this may be, the usual type of paroxysmal hæmoglobinuria following remotely upon syphilis and nearly upon exposure to cold bears little resemblance to the usual type of pernicious anæmia. Yet the first group of cases (Nos. 1 and 2) described in this paper provide examples as near as may be intermediate between the two conditions, and in considering one state of internal hæmolysis it is necessary to consider other conditions associated with the same process. It does not, however, appear to us probable that the essential underlying factors in pernicious anæmia and paroxysmal hæmoglobinuria are in any sense identical.

Fifth Group.

The fifth group is represented by only one case.

CASE 8.—A chauffeur, aged 33, admitted to the London Hospital in February, 1922, with the history that he was quite well up to 12 years before admission. He then began to feel weak and noticed that his colour became yellow. After continuing more or less in this state for four years he was admitted to a hospital in London, yellow tinged and with a palpable spleen. Splenectomy was performed for "acholuric jaundice." The fragility of the patient's red cells was stated to be normal before and to be increased after operation. He said that after the operation he lost his yellow colour and was quite well for three years, except that every summer he felt a little weak and languid. At the end of the three years he again became yellow, and periodic attacks of sore tongue occurred, usually in the summer months. A year after the return of his symptoms he began to have difficulty in walking, which gradually got worse, so that a year before he came under our observation in the London Hospital he was bed-ridden and had lost control over his bladder and rectum.

On examination after his admission to the London Hospital this patient was a well-nourished man with a lemon-yellow tint. His heart and lungs were normal, and beyond the scar of his operation the abdomen was also normal. He complained of persistent numbness in his upper and lower limbs, most marked in the feet and hands. He was intelligent without any obvious mental abnormalities. His fundi and cranial nerves were normal. His upper limbs showed no weakness, local wasting, or disturbance of tone, but they were slightly ataxic. There was marked weakness of his lower limbs with wasting, especially below the knees, and gross ataxia. Tone was not apparently affected. Biceps-jerks were brisk and equal, knee-jerks present and equal, and ankle-jerks absent, while his plantar responses were extensor. Sensibility* to cottonwool and to pin-prick was diminished over both lower limbs, but elsewhere was perfect. Postural sensibility was greatly diminished in the toes of both feet and to a slight extent in the fingers of both hands. There was frequency of micturition with defective control over the bladder and bowel.

Repeated examinations of his blood showed, during his six months' stay in the London Hospital, gross anæmia, the red cells varying from 600,000 per c.mm. to 3,000,000 per c.mm., with a high colour-index varying from 0·8 to 1·1. There were extreme morphological changes in the red cells and megaloblasts were very numerous. The serum was bile-tinged, but the resistance of the red cells to hæmolysis was normal. A fractional test-meal showed a complete absence of HCl and the W.R. in the blood was negative. The patient stated that his mother had five sisters and two brothers; one of the former had an enlarged spleen, was yellow, and died at an early age; and another died of "pernicious anæmia." In addition, one of his mother's brothers was admitted to the Prince of Wales's Hospital, where a diagnosis of "pernicious anæmia" was made and confirmed by the blood picture.

On his discharge from the London Hospital he was transferred to a local infirmary, where he died 16 months later and about 14 years after the onset of his illness. A post-mortem examination was not obtained.

The diagnosis in this case would appear to rest between pernicious anæmia and acholuric jaundice, and if we confine ourselves to these alternatives the evidence favours that of pernicious anæmia. The normal fragility of the red cells, the typical blood count, the achylia, the presence of subacute combined degeneration of the cord, and the history of a sore tongue all support this view. The most striking feature in the case and the one which raises any doubt in the question of diagnosis is the occurrence of three other examples of the same condition in the family. Familial pernicious anæmia has been recorded by Bartlett,[2] Patch,[13] and Minot [10] and, though rare, seems well established.

The familial occurrence of pernicious anæmia appears to us of the greatest importance in any consideration of the ætiology of the condition. A familial incidence places before us two alternatives in regard to ætiology. Either we have to consider the familial type as being due to a different cause, or we have to find a cause capable of producing the disorder in more than one member of the same family. The first alternative, that the familial type has a different ætiology, receives some support from a consideration of the case described here, in that certain features usually absent in pernicious anæmia were present—namely, jaundice, enlargement of the spleen sufficient to suggest splenectomy, advanced cord changes,* and a very chronic course of some 14 years. Any one of these features may be present in pernicious anæmia, but none of them commonly, and the combination of them added to the familial history suggests a different ætiology in the familial variety.

The other alternative—to find a satisfactory ætiological explanation for the occurrence of the disorder either in a single individual or in more than one member of the same family—presents great difficulties. The most popular conception of the ætiology of pernicious anæmia is that a hæmolytic poison is manufactured in the intestinal tract as the result of abnormal bacterial action. This might result from either the entry of abnormal bacteria or an upset of the balance of the normal intestinal flora.

* The relationship of subacute combined degeneration of the cord to pernicious anæmia is being made the subject of a special study, the results of which we hope to publish in the near future.

If the former explanation is adopted, it is difficult, if not impossible, to understand why contacts, other than members of the family, should not sometimes develop pernicious anæmia. The second explanation is attractive, and presupposes as its essential basis some persistent alteration, congenital or acquired, in the bacterial environment. It has been claimed that achylia is the primary abnormality in pernicious anæmia, and Hurst[6] has recently suggested that familial achylia, which is known to occur, is a complete explanation of the appearance of familial pernicious anæmia. But the observation, also quoted by Hurst, that 4 per cent. of normal individuals have achylia is strong evidence against this view; for the incidence of achylia in the general population being so high and that of pernicious anæmia so low the chances against any small group of individuals with achylia presenting three or more examples of pernicious anæmia would be so great as to imply that some other factor was involved.

Whatever the ætiology of pernicious anæmia may ultimately prove to be, the fact that the disorder is occasionally familial is suggestive, and a close study of members of affected families seems to be called for.

HÆMOLYTIC ICTERUS AND APLASTIC ANÆMIA.

In addition to the small groups of disorders described here there are two conditions, of which we have seen several examples, and to which attention should be directed in any discussion upon the relationships of pernicious anæmia. We refer to hæmolytic icterus and aplastic anæmia. Although in both these states internal hæmolysis occurs, the important underlying factors in them—namely, the red cell fragility of hæmolytic icterus and the red marrow destruction of aplastic anæmia—are absent in pernicious anæmia. Yet, as we have seen, cases are met with in which the diagnosis between pernicious anæmia and hæmolytic icterus may be difficult, as in a case recently described by Parkes Weber.[15] In the last nine cases of hæmolytic icterus seen at the London Hospital the colour-index was 1·0 or over in one or more of the blood examinations made in eight cases, and 0·5 in one case. Nucleated red cells were present in four cases and in one case normoblasts were numerous and megaloblasts were also found. Such a blood picture closely resembling that of pernicious anæmia is only to be expected in cases of internal hæmolysis. Conversely the continued production of immature and imperfect cells in pernicious anæmia might lead to the appearance of fragile erythrocytes. The fragility of the red cells in pernicious anæmia is usually normal or less than normal, but we have occasionally found it to be slightly increased. The fragility of the red cells in hæmolytic icterus is usually very much greater than the normal, but occasionally the difference may not be marked, and in such cases the condition is, in our experience, more often the acquired form of hæmolytic icterus than the congenital and familial variety. We infer that although pernicious anæmia and hæmolytic icterus are different states, it may not always be easy or possible to distinguish them during life. Aplastic anæmia, as we have observed the condition when it follows poisoning by a known chemical agent, such as trinitrotoluene, presents a blood picture by which the disorder may readily be recognised. When the ætiological factor is unknown typical examples of the disorder may also be met with, but not infrequently states are found which appear to be intermediate between pernicious anæmia and aplastic anæmia. Such states may represent examples either of pernicious anæmia presenting a subnormal degree of marrow regeneration or of aplastic anæmia in which marrow destruction is less complete than usual and hæmolysis is more excessive.

THE COMMON FACTOR OF INTERNAL HÆMOLYSIS.

As we have already stated, we, for the present, assume that internal hæmolysis is a pathological process common to all the disorders described in this paper, diverse though they are in many respects in their symptomatology and course. It is this feature which links them together and brings them into relationship with pernicious anæmia, because while the essential factor underlying this disorder is a subject of both conjecture and dispute, there is fairly general agreement that the predominant morbid process is destruction of red cells within the body.

The occurrence of this red cell destruction has, indeed, been recently called into question by certain workers, and notably by Ashby[1] and by Whipple.[16] Ashby puts forward the suggestion that the increased activity of the bone marrow in pernicious anæmia may be only apparent. She grants that the stimulus to red cell production causes an increase in the number of dividing cells, but she suggests that some factor is present which retards the rate of division, the net result being an increased red marrow area with a decreased cell output. Hæmosiderin deposition she regards as evidence only of failure to utilise sufficiently quickly the iron released in a normal rate of blood destruction.

Ashby's experimental evidence in support of this view was based on the results obtained from the transfusion of Group IV. blood into patients with pernicious anæmia belonging to other blood groups. The elimination of Group IV. corpuscles was watched by diluting the recipient's blood, after transfusion, with Group IV. serum and noting the number of corpuscles that remained unagglutinated. In four patients with pernicious anæmia examined over a long period by Ashby no evidence of rapid destruction of the transfused red cells was found. In two other patients, however, the elimination of the transfused blood appeared to be remarkably rapid.

Ashby's observations are, by the nature of the methods employed, subject to considerable experimental error. She appears to assume that the addition of Group IV. serum to blood of another group will agglutinate all of the red cells of that group, but this we have never observed to be the case. An examination of her protocols, moreover, shows that after a transfusion of only 500 c.cm. of Group IV. blood the foreign cells were estimated to form in many instances from one-fourth to almost the whole of the total cells. We have ourselves by means of large and frequently repeated transfusions raised the red cell content of a patient suffering from pernicious anæmia from under 1 million per c.mm. to approximately 5 millions in a fortnight. Yet two or three weeks later the red cell count was below 1 million again. The natural presumption is that the transfused red cells had been destroyed. In some of Ashby's cases the hæmolytic process was active during the period of observation, in others it was not and that is the common experience in this disorder.

Further criticisms of Ashby's deductions have been made by Wearn,[14] Warren, and Ames, and seem to be pertinent.

Whipple elaborates a novel scheme of normal pigment metabolism in which he suggests that possibly all pigment construction units pass through the stage of a "pigment complex" which is called upon either to construct hæmoglobin or bile pigment or to discharge urobilin or urochrome and that bile pigments are derived in part only from hæmoglobin. Whipple further suggests that a patient with pernicious anæmia having only one-fifth the normal number of red cells excretes twice or three times the normal amount of stercobilin, and that if stercobilin is a complete index of blood destruction the patient must regenerate his total red cell mass every three days instead of the supposed normal of 30 days.

Whipple prefers to explain the observed facts in pernicious anæmia by supposing an over-production of pigment associated with a deficiency or disorder of red cell stroma material, and he mentions hæmochromatosis as a condition in which no evidence of hæmolysis exists. But this does not appear to us to affect the question since it is not denied that an abnormal metabolism, retention, or distribution of pigment may occur without hæmolysis. Whipple's interesting paper is, as he himself points out, mainly speculative, and it appears to us to have more value as a contribution to pigment metabolism than as an

argument against increased destruction of red cells in pernicious anæmia.

That an increased production of pigment may occur in pernicious anæmia and that all the stercobilin in the fæces may not be derived from hæmoglobin is possible, but it seems to us to be more reasonable to account for the associated diminution of red cells in this disorder by the assumption of an increased red cell destruction for the reasons indicated by us at the commencement of this paper.

EXPLANATION OF VARIED CLINICAL PICTURE.

But before internal hæmolysis can be accepted as the pathological process common to all the disorders here discussed it is necessary to offer a satisfactory explanation for the wide variation in the clinical pictures presented. This, indeed, is our main purpose in this paper and is an attempt to elucidate the mechanisms underlying the production of those abnormal blood states, usually regarded as distinct entities, in which, whatever their ætiology may be, destruction of the red cell or its precursor is the predominant feature. There are two processes that appear to us to be of great importance in determining the clinical picture.

(1) *The Main Incidence of the Lesion.*—When the site of the lesion is chiefly in the circulating blood the red cell is distorted or destroyed in its mature state and hæmoglobin is liberated. To compensate for this deficiency increased production of new red cells occurs, and if the destructive process is prolonged there is consequent proliferation of the red marrow. Examples are paroxysmal hæmoglobinuria, in which red cell destruction is of short duration, and pernicious anæmia, in which the process is more chronic. When the lesion lies mainly in the bone marrow its consequences are more serious, for parent and immature cells are destroyed with resulting diminished regenerative capacity corresponding in amount to the extent of the damage. These cells do not, of course, contain hæmoglobin, and hæmoglobinuria, icteric tinging of the skin, and deposition of free iron in the viscera are absent. This occurs in aplastic anæmia. It may happen, however, and probably not infrequently, that the destructive process is not so specific in its incidence, but either progresses simultaneously in the circulating blood and bone marrow, or begins in one situation and extends to the other. Inability to categorise certain cases as pernicious anæmia or aplastic anæmia is the occasional experience of most investigators. Another group is represented by hæmolytic icterus where at least one link in the pathological complex constituting the lesion seems to be a lowered resistance of the red cell stroma to abnormal noxious influences or ordinary wear and tear. This defect may be congenital or acquired.

(2) *Rapidity of the Pathological Process.*—A second important factor in determining the evolution of the complaint is the rate and duration of the destructive process. When the process is acute, as in arseniuretted hydrogen gas poisoning (Cases 3 and 4), all the phenomena of rapid red cell disintegration appear—drowsiness, delirium, jaundice, hæmoglobinuria, and profound anæmia. If the dose is sufficiently large the patient dies. A less severe although still acute effect is evident in paroxysmal hæmoglobinuria. In pernicious anæmia, on the other hand, the process is characteristically slow, but phases of more rapid destruction are common and account for the relapses. Sometimes these are acute and in Cases 1 and 2 the paroxysmal attacks of jaundice, hæmoglobinuria, and aggravation of the anæmia were doubtless due to sudden exacerbations of the destructive process. The obvious explanation of the prolonged course, sometimes lasting many years, in certain cases of pernicious anæmia is that red cell destruction is less extensive and unusually prolonged.

The patients, Nos. 2 and 6, described above, were admitted to the London Hospital under the care of Dr. Robert Hutchison, and we are much indebted to him for his help in their investigation.

(*Continued at foot of next column.*)

THE METABOLIC CHANGES ASSOCIATED WITH X RAY AND RADIUM TREATMENT.

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THE chief interest at present in the consideration of the causation of radiation "sickness" or toxæmia centres on the more essential biochemical changes resulting from radiation. Many of the other factors which have been discussed can only be subsidiary or rarely operative, such as gas poisoning in X ray rooms, or high induced voltage of patients having X ray treatment. Psychical causes also can only be at work to a limited extent. But in temporary depression of the functions of the kidneys, or in a toxæmia from the definite organic products of proteolytic or autolytic changes (possibly anaphylactic), or in inorganic disturbance from acidosis or other metabolic changes, the essential causes are now being sought. It was the recent hypothesis of Andersen and Kohlmann that roentgen sickness is "like an acute uræmia," which prompted the following investigation, the results of which are here given in a greatly condensed form. It was felt that should the condition be anything "like an acute uræmia" a study of the basal metabolism would show definite and characteristic changes. If it proved not to be uræmic other characteristic changes might be found which would enable radiation sickness or toxæmia to be grouped with the analogous metabolic changes also producing "sickness" when present in sufficient intensity: anæsthesia, diabetic intoxication, pregnancy, protein poisoning, the toxæmia of fevers, migraine, uræmia, &c. Also by this means suitable preventive and curative treatment might be indicated.

Literature of the Subject.

As to the clinical incidence of radiation toxæmia, of 160 cases noted by Miescher 60 per cent. showed no disturbance clinically; in the 40 per cent. which showed disturbance this was most marked when the radiation was on the epigastric area. Of 81 cases noted by Groedel and Lossen sickness was noted in every fourth case radiated on the head or neck, in every third case radiated on the thorax, and in every second abdominal case, their conclusion being that the "sickness" depends on the amount of glandular tissue radiated.

The literature on the different hypotheses and the clinical and experimental findings is already large.

(*Continued from previous column.*)

HÆMOLYSIS IN PERNICIOUS ANÆMIA: REFERENCES.

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The factor of gas poisoning has been suggested and worked at by Pfahler. Guthmann, and others. Rieder suggested the possibility of the induced high voltage of the patient's body during intensive X ray treatments. Edsall and Pemberton in 1907 put forward the view that the toxic products of nucleo-protein decomposition, which the kidneys were not able to excrete quickly, were the chief cause of the condition, which they regarded as an acute toxæmia. The white blood cell destruction may stimulate enzymes, especially autolytic ones. This aspect was reviewed by Richards in 1914–15. A degree of toxic nephritis has been suggested, causing a transitory uræmia, but, if present, this has not been of sufficient intensity experimentally to show definite histological changes. Proteoses can, however, depress the renal function for many hours to a quarter of the normal (Hall and Whipple).

Andersen and Kohlmann, as already noted, view the condition as similar to an acute uræmia; they find changes in the mineral content of the blood, in the calcium, sodium, and potassium content, the calcium being increased and potassium decreased at first, becoming normal again in 24 hours, the sodium being lessened for several days. They view roentgen sickness as vagus stimulation, causing altered blood mineral content, and they recommend calcium salts by mouth and intravenously for prophylaxis and in treatment of the established condition. Nürnberger found increased blood-sugar on the first and second days. Lange brought forward an acidosis hypothesis, which, as Sir Humphry Rolleston says in his recent masterly survey of the subject, has not received the attention it deserves. Observations on the point are few and contradictory. Denis, Aldrich, and Martin found acidosis in rabbits. Case found tests for acidosis negative. Golden found in patients and dogs no less alkali reserve, therefore no acidosis. Hussey found in rabbits increased alkali reserve 24 hours after. Lange recommended sodium bicarbonate treatment. The anaphylaxis view of Bergonié and others is apparently negatived by the fact that the reaction occurs as markedly after the first exposure as after later exposure. Also Hall and Whipple found in dogs rather an increased tolerance than otherwise with repeated exposures. Prendergrass and others, as a result of radium experiments on the brain, conclude that there is first a nuclear death, then the nerve cells are acted on by intracellular ferments, lecithin lipoids are broken up into neurin and cholin, and these when set free are autolytic causes of toxæmia. The chemical imitation of the effects of radiation by injection of cholin and enzytol (Werner) may here be mentioned. Autolytic changes in the intestinal epithelium have been specially noted by Hall and Whipple in their long series of experiments on dogs. The changes were very marked with massive fatal or sub-fatal doses, and were comparable with those found in acute hæmorrhagic pancreatitis or acute intestinal obstruction.

They regard X ray intoxication as similar to the intoxication after burns, due to toxic protein decomposition products. They found a latent period of 24 hours or longer, and a fourth-day maximum of toxic effect. They found no evidence of a true nephritis, and the chemical changes they noted were a 50–75 per cent. increase in the urinary nitrogen, increased purin bases, and phosphorus radicles. The non-protein nitrogen in the blood was two to three times the normal. On the whole, however, they found no very constant alteration in the blood as regards urea-nitrogen, total non-protein nitrogen, uric acid, creatinine, or sugar. But the chief difference from the normal they found was a deviation in the acid-base equilibrium, with increase in the hydrogen-ion concentration just after the treatment, and sometimes a slight lowering of the alkali reserve, and after 24 hours a diminished hydrogen-ion concentration and an increased alkali reserve. Whether this disturbance is comparable with the disturbance in fevers, &c., of the acid-base equilibrium remains for further research. Also as to its mechanism in irradiation it is not yet clear whether this change is due to alterations in the colloidal cell and serum equilibrium, as Hardy's experiments with acid and alkali globulin suggested, and as Colwell (quoted by Rolleston) has speculated. X and gamma radiation acting, so far as we understand, solely by the emission of negative beta-corpuscular radiation, might be expected to cause a transitory local and general increase in acid content. Thus would Lange's hypothesis of local and general acidosis find some support, as one aspect of the radiation effect.

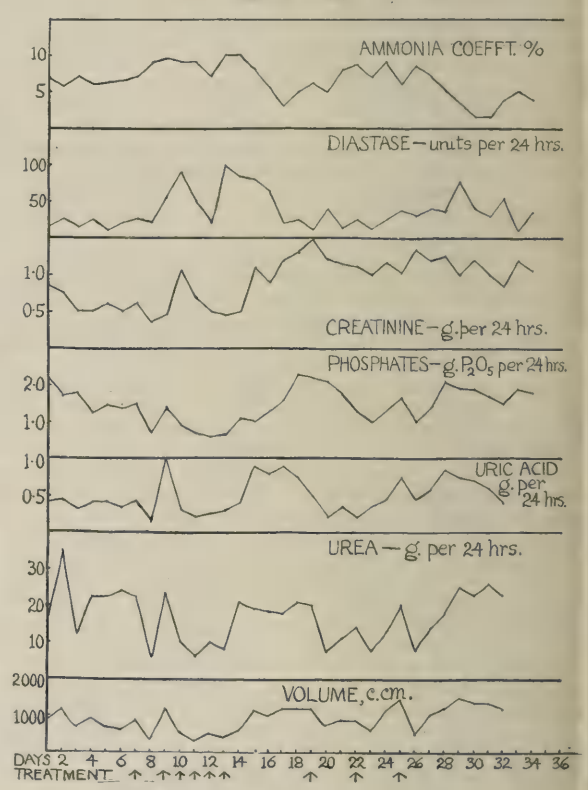
A more complete study of the problems involved than is here attempted would inter-relate the clinical and technical variations more fully with the laboratory findings. Patients might be grouped as to the skin surface area radiation both in intensity and time, according to the depth or "volume dose," also to the site of radiation, such as glandular, splanchnic, or more indifferent areas, and again as to age, sex, &c.

The Present Investigation.

Owing to the enormous amount of labour involved in investigating even a single case, our numbers are too small to enter into discussion on such points of detail. The patients studied were from four clinical groups: (1) cases of leukæmia; (2) cases of exophthalmic goitre; (3) prophylactic post-operative radiation of breast cases; and (4) radiation of patients with malignant disease in various parts of the body. Cases in Group 1 were treated with radium to the enlarged spleen, with or without X radiation to the long bones or enlarged glands. The method of Ordway and Giffin was followed, with minor modifications, in using the radium. Cases in Group 2 were treated with X radiation to the thyroid (and thymus in some instances). A shorter X ray wave-length was used in a few of Group 3 cases and in all of Group 4 cases; thus a wide range of X and gamma wave-lengths was used.

In this preliminary investigation it was decided to confine our attention mainly to the urine, although some blood observations were made. The effect of

CHART 1.

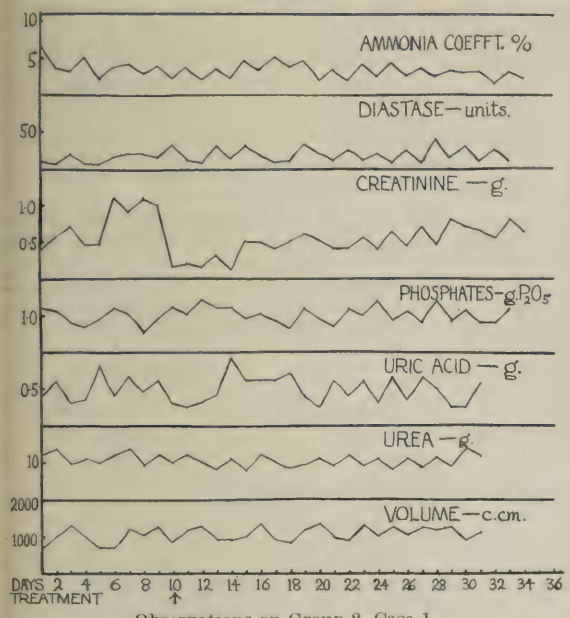


Observations on Group 1, Case 1.

radium and X rays on human subjects is a very difficult matter to investigate. Since it is impossible to observe the effects of radiation on normal human subjects, the investigator is forced to work with diseased individuals; hence he will have three factors complicating his results—the disease in question, the effect of treatment on the disease, and, finally, the effect of the rays on the patient's metabolism.

All the patients of this series were in bed, and were maintained on a constant diet. We were not

CHART 2.



Observations on Group 2, Case 1.

able to keep the diet purin-free, as in the experiment of Knudson and Erdos. The urine was collected in 24-hour specimens, which were completely analysed. All cases were examined for at least a week before treatment commenced, in order to fix the normal levels of their urinary constituents. Specimens were analysed so long as the patients remained in hospital. The following observations were made on each specimen: volume, urea, uric acid, ammonia, acidity, total nitrogen, ammonia coefficient, phosphates, chlorides, creatinine, and diastase. As some of the investigations extended over five months it is impossible to publish tables showing all results. Three charts are given (Charts 1, 2, and 3), showing those constituents in which most variation was found, and a general statement based on the tables is also given.

Results.

After a careful review of the results it was thought best to classify the observations according to the site of radiation. These fall under four headings: (1) abdominal irradiation; (2) cervical irradiation; (3) thoracic irradiation; and (4) irradiation of any other part of the body.

1. *Results of Abdominal Irradiation.*—In this group five cases were investigated.

CASE 1.—Male, aged 62, admitted suffering from lymphatic leukæmia. He was treated with radium applied to the spleen. The urinary observations were carried on throughout the treatment, a period of four months.

CASE 2.—Male, aged 31, admitted with a carcinoma of the testicle; this was removed, but complete removal of aortic glands was found to be impossible. Intensive X rays were applied to the abdominal gland area.

CASE 3.—Male, aged 41, suffering from spleno-medullary leukæmia. Radium was applied to the spleen and X rays to the long bones.

CASE 4.—Female, aged 46, with carcinoma of the sigmoid colon; the growth was removed after a colostomy had been done; recurrence in and near the colostomy. Intensive X ray treatment was given.

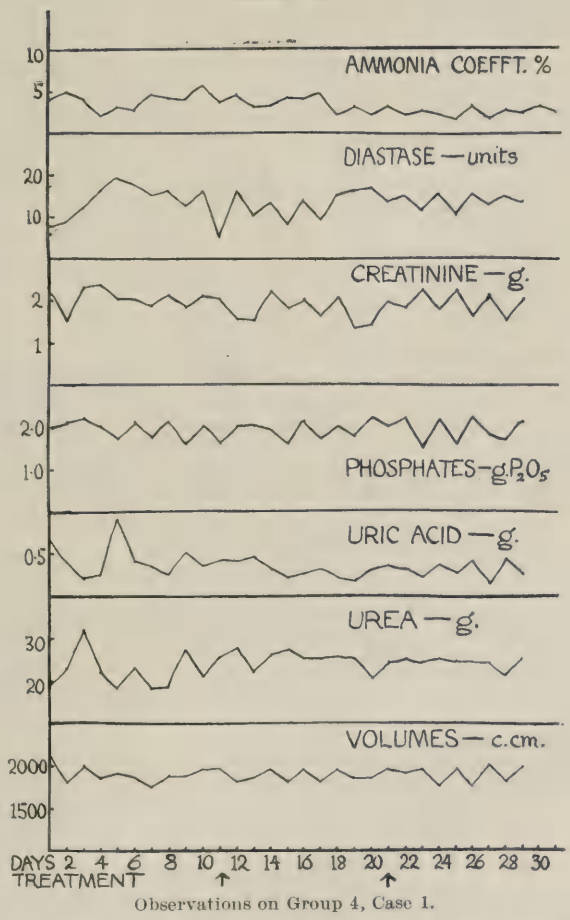
CASE 5.—Male, aged 30, with spleno-medullary leukæmia, treated with radium to the spleen.

In all this series of cases, there was a profound effect on the urine. The results are shown in the following summary.

Volume: Sudden fall to half of normal, recovery in two days.
Urea: Sudden fall to one-eighth of normal, recovery in two days.
Uric acid: Sudden fall to half of normal, rise in three days above normal, recovery in five days.
Ammonia: Sudden fall to 0·7 of normal, recovery in three days.
Acidity: Sudden fall to 0·7 of normal, recovery in three days.
Ammonia coefficient: Rise for three days, fall to normal in six days.
Creatinine: Slight fall.
Phosphates: Slight fall, followed by rise, normal in four days.
Chlorides: Slight rise, normal in six days.
Diastase: Sudden rise, normal in two days.
Total nitrogen: Slight fall, normal in two days.

These results were observed in all the cases investigated. Since it is impossible to reproduce all the

CHART 3.



Observations on Group 4, Case 1.

tables, the chart of Case 1 is published. This shows the variation in volume, ammonia coefficient, uric acid, urea, diastase, and phosphates.

2. *Thyroid or Cervical Irradiation.*—In this group 2 cases were examined, both being cases of exophthalmic goitre.

CASE 1.—Female, aged 45; both sides of neck irradiated (X rays).

CASE 2.—Female, aged 30; both sides of neck irradiated (X rays).

The results of urinary analysis on these cases are quite different from those in Group 1. There was no marked change in any of the urinary constituents

excepting creatinine. This body practically disappears from the urine during the period of irradiation, falling from 1·0 g. to 0·16 g. per 24 hours in Case 1, and from 1·2 g. to 0·09 g. in Case 2. The creatinine did not reach its normal level for four days. The exact explanation of this is very difficult. It has been held that the parathyroids are responsible for some part of creatinine metabolism, probably the conversion of guanidine into creatinine. The above effect could be explained on these lines, assuming that the radiation temporarily paralysed the action of the parathyroid glands.

3. *Thoracic Irradiation.*—Three cases were investigated (including two carcinoma mammæ), but no change was found.

4. *Irradiation of any other Part of the Body.*—A series of cases, with growths of the face and extremities, was investigated, but no change could be found.

Investigation of Blood.

Blood was collected from patients in each case of the above groups before and at varying times after irradiation. The results are shown in Table I. It can be seen that the results are mainly in accordance with the findings on rat's blood—namely, a marked fall in the blood-urea content, with very little change in any of the other constituents.

TABLE I.

Group.	Case.	Particulars of case.	Non-protein nitrogen.	Urea.	Uric acid.	Amino-acid nitrogen.	Sugar.	Chlorides.	Creatinine.
1	1	Before treatment.	35·28	42·75	—	—	166	—	—
		1 day after radium.	53·20	34·00	—	—	170	—	—
	2	Before.	42·80	22·50	—	—	—	—	—
		2 days after Erlangen.	39·20	10·00	—	—	—	—	—
	3	Before.	56·00	37·00	—	—	—	—	—
		3 days after.	32·40	32·00	2·53	5·0	100	478	1·25
		2 days after 2nd treatment.	33·00	22·80	2·07	5·2	118	502	1·19
2	1	2 days after.	50·00	27·40	2·50	5·1	93	540	1·20
			48·20	26·20	2·40	5·0	100	539	1·40
4	1	24 hrs. after Coolidge.	31·80	26·00	3·08	4·1	119	445	1·15
			32·50	24·00	3·12	4·6	105	460	1·07

Investigation of Fæces.

The fæces were analysed for fat content. The results are given in Table II. There is a rise in fæcal fat content in cases of abdominal irradiation, but no effect could be discovered when other parts of the body were subjected to treatment.

TABLE II.—*Fæces Collected on the Second Day After Irradiation.*

Group.	Case.	Description of case.	Time of radiation.	Fat %	Free fatty acids %	Neutral fat %
1	1	Abdominal.	Before.	28·0	8·0	3·0
			After.	40·0	2·0	28·0
	2	,,	Before.	30·0	—	—
			After.	54·0	—	—
	3	,,	Before.	21·2	11·3	2·0
			After.	59·6	1·9	14·8
2	1	Cervical.	Before.	29·2	—	—
			After.	30·6	—	—
3	1	Thoracic.	Before.	30·0	—	—
			After.	28·7	—	—
4	1	Arm.	Before.	29·3	12·0	2·0
			After.	30·2	10·0	2·1

Conclusions.

(1) Exactly similar results were found in patients treated with X or with gamma rays.

(2) The changes in metabolism produced in the patients were found to vary with the site radiated. The changes are summarised as follows:—

(*a*) Irradiation of the head, thorax, and limbs produced no change in the metabolism of the cases examined by us.

(*b*) Radiation of the abdomen and spleen produced definite urinary and blood changes—namely, there was a sudden fall in the 24-hourly amounts of the following urinary constituents: urea, uric acid, ammonia, and titratable acidity, creatinine, total nitrogen, and phosphates. The volume of the urine was also greatly decreased. After some three days the excretion of these substances rose to about the normal figure. In the case of uric acid, and of phosphates, the 24-hourly amounts continued to increase after the original level had been reached, but returned to normal again in about five days. The chloride content and diastase showed an immediate increase, returning to normal in about three to six days. The ammonia coefficient showed an increase for about three days, falling to normal in six days. Blood analysis showed a marked decrease in the urea content, with very little change in any other of the blood constituents. These results were obtained in every case of this group investigated. Examination of the fæces showed an immediate increase in the fæcal fat content. This increase is almost solely in the neutral fat fraction.

From these results it would appear that the effects of radiating the abdomen can be explained by a temporary inhibition of the functions of the principal abdominal glands, such as the liver, pancreas, and kidneys. It can be seen that our figures give no support to the acute uræmic theory of Andersen and Kohlmann. We could obtain no evidence of nitrogen retention such as would be expected if uræmia had been induced. These workers based their conclusions on analysis of the mineral content of the blood, a line of work not touched by us, yet most workers will agree that there is always evidence of nitrogen retention in cases of uræmia. The rise in the ammonia coefficient following radiation is in agreement with the acidosis theory of Lange. The increase in the fæcal fat content also supports the work of Whipple and Hall, who showed that radiation of dogs produced marked alimentary symptoms, even verging on to pancreatitis if the dose were large enough. The fall in urea content of the blood is very difficult to explain, but it would appear to us that it might be brought about by a temporary inhibition of the metabolic functions of the liver.

(*c*) Radiation of the cervical region produced no change in the metabolism as evinced by a study of the blood and urine except in one respect. There was an immediate fall in the excretion of urinary creatinine. On the day after exposure this body almost disappeared from the urine, and recovery did not take place until about the fourth day. Practically no alteration in the blood creatinine content was found. This curious effect might be explained by assuming that the parathyroids had been temporarily paralysed, and could not play their normal part in the metabolism of creatinine, which is supposed to be the conversion of guanidine into creatinine.

(3) Three cases of very well marked X ray sickness were examined, but no change in their metabolism following exposure to rays could be detected. The sickness in these cases was apparently psychical.

(4) A considerable number of cases have been treated prophylactically with calcium chloride, &c., before radiation, and a few with sodium bicarbonate; all such cases show less reaction. In the light of the results set forth in this paper, prophylactic measures are being thoroughly investigated.

We have to express appreciation of the interest and kindness of members of the hospital staff, more especially Dr. R. A. Young, Dr. C. E. Lakin, Mr. W. Sampson Handley, and Mr. G. Gordon-Taylor. The amount of work involved in making the analyses detailed in this paper was very great, and we have to thank the members of the staff of the biochemical department who participated therein. This work was made possible through the generosity of Sir William Veno.

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(*Continued at foot of next page.*)

EXPERIMENTAL AND THERAPEUTIC ALTERATIONS OF HUMAN TISSUE ALKALINITY.*

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THE hydrogen-ion concentration in any tissue depends on the ratio of free carbonic acid to bicarbonate in it. For

$$\overset{+}{H} + H\bar{C}O_3 \rightleftharpoons H_2CO_3 \rightleftharpoons H_2O + CO_2.$$

And since the water concentration varies little, we have approximately

$$[\overset{+}{H}] \times [H\bar{C}O_3] = k[CO_2]$$

$$\therefore cH = [\overset{+}{H}] = \frac{k[CO_2]}{[H\bar{C}O_3]}.$$

The hydrogen-ion concentration of the tissues may be altered by varying the numerator of this fraction, the CO_2 pressure. This occurs in respiratory disease, and can be produced experimentally by CO_2 inhalation on voluntary overbreathing, but such measures can rarely be employed in therapeutics. It is much easier to alter the bicarbonate concentration. This can be increased by the ingestion either of sodium bicarbonate or the sodium salt of an organic acid, such as acetic or citric, which is rapidly oxidised to bicarbonate. It can be diminished by taking chlorides or certain other salts of ammonium or calcium. Ammonium chloride is absorbed from the gut and converted in the liver and perhaps elsewhere into urea, the hydrochloric acid neutralising bicarbonate.

$$2\,NH_4Cl + 2\,NaHCO_3 = CON_2H_4 + 2\,NaCl + H_2O + 3CO.$$

Calcium chloride reacts in the gut with the alkaline digestive juices, forming calcium carbonate which is excreted per anum, the sodium chloride formed being reabsorbed.

$$CaCl_2 + 2\,NaHCO_3 = CaCO_3 + 2\,NaCl + H_2O + CO_2$$

In each case the final result is the same as if hydrochloric acid had been taken. The urea formed from ammonium chloride is unimportant, but about 10 per cent. of the calcium of calcium chloride is absorbed and causes unpleasant symptoms.

Dosage of Inorganic Salts.

To get a marked effect with inorganic salts, as with alkaloids, we must take an appreciable fraction of the lethal dose. Appropriate doses for adults are 45 g. $NaHCO_3$, 70 g. $NaC_2H_3O_2{\cdot}3H_2O$, 20 g. NH_4Cl, 45 g. $CaCl_2{\cdot}6H_2O$. Sodium acetate is much less nauseating and purgative than bicarbonate, and causes no eructation, but it is uncertain how completely large doses are oxidised. Ammonium chloride may cause vomiting in strengths over 2 per cent., whilst calcium chloride produces violent diarrhœa. The results which I am putting forward are mainly those obtained with the above doses of these substances by various colleagues and myself in human experiments at Oxford and Cambridge in the last five years.

Sodium bicarbonate is very rapidly excreted, but it is possible to increase the bicarbonate or "alkali reserve" of the blood by 20 per cent. by its ingestion. The alveolar CO_2 pressure rises by much the same amount owing to a slowing down of the breathing, so the reaction of the arterial blood is little altered, though the liver doubtless becomes very alkaline. The urine may contain 3 per cent. of sodium bicarbonate and be free from ammonia. Similar effects are obtained with the acetate.

Ammonium chloride may reduce the alkali reserve and alveolar CO_2 pressure to less than half the normal values. The acid excretion in the urine may rise to four times, the ammonia excretion to six times the normal value. But except for hyperpnœa, which is only distressing during exercise, no discomfort is felt. Clinically, acidosis is generally associated with acetone body formation or uræmia. When, however, the bicarbonate of the blood is merely replaced by chloride we have an uncomplicated acidosis, which has no serious effects until at least two-thirds of the lethal dose has been taken. After such an acidosis the alkali reserve does not return to normal for four or five days, so the effect of doses is cumulative.

Alkalosis, whether due to overbreathing or alkali ingestion, causes an upset of carbohydrate metabolism like that of diabetes. Aceto-acetic and β-oxybutyric acids appear in the urine. The respiratory quotient falls, sometimes to 0·70 and lower, showing that no carbohydrate is being oxidised. The fasting blood-sugar rises only slightly, but polarimetric examination by the method of Winter and Smith shows that, as in diabetes, the normal sugar has been replaced by a highly dextro-rotatory substance. My normal glucose tolerance is more than 200 g., but a dose of 100 g. taken five hours after 60 g. of bicarbonate gave a rise of blood-sugar to 0·19 per cent. with a very slow fall, and glycosuria, without abolishing the acetonuria.

Limitations of Alkali Treatment.

Such results emphasise two points. First, acetonuria should not be treated with alkalies unless there is reason to suspect serious acidosis. Secondly, although alkali treatment saves life in diabetic coma, there is no reason for pushing it to the point of re-establishing the normal alkali reserve. Adlersberg has gone further, and deliberately induced acidosis in mild cases of diabetes by doses of 18 g. per day of $H_2NH_4PO_4$, which is less nauseating than NH_4Cl, but acts as a purgative. He was able to halve the urinary acetone excretion and in some cases the glucose excretion also. However, he does not report many cases, and his results may be due in part to the increase of phosphates in the blood. But the probability remains that glucose is best oxidised somewhat on the acid side of the normal reaction.

When, however, the acidosis is pressed too far a different type of disturbance of carbohydrate metabolism arises (in me at least). There is no acetonuria and the respiratory quotient is normal or high—i.e. carbohydrates are easily oxidised; moreover, the rotatory power and fasting level of the blood-sugar is normal. But it rises rapidly after meals, and 100 g. of glucose produce a rise to 0·19 per cent. and glycosuria. There is a failure to store glucose, but not to oxidise it, and the condition is therefore not analogous to diabetes, as believed by authors who produced it in animals. This condition, which may be due to liver damage, appears late in the course of the acidosis and outlasts it. In severe diabetes with acidosis it is

* A summary of remarks made at a meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine on Feb. 12th, 1924.

(*Continued from previous page.*)

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presumably superimposed on the failure of pancreatic function, and an improved glucose tolerance as the result of treatment cannot be taken to indicate a better formation of insulin by the pancreas, or an increased power of oxidising glucose.

Ammonium chloride acidosis has a large effect on inorganic metabolism. We have observed the following urinary excretions per day expressed in percentages of the normal values: Na 250 per cent., K 520 per cent., Ca 330 per cent., P 180 per cent. The first three elements serve to neutralise the acid, the latter to "buffer" the urine. The calcium content of the serum rises by about 10 per cent. Calcium chloride may cause a rise of 25 per cent., the effect of calcium absorption being superimposed on that of acidosis. American observers who were unable to raise their serum calcium had contented themselves with one-tenth of the dosage which we employed. Sodium bicarbonate lowers the serum calcium 10–20 per cent. Ammonium and calcium chlorides are very powerful diuretics. After 65 g. of NH_4Cl in three days my weight falls about 7 lb. and the hæmoglobin of the blood rises by 20 per cent., even although I drink freely. This and the salt excretion are probably due to the fact that the colloids of the body, being brought nearer their iso-electric points, retain less water and salts. Blum and his pupils have found calcium chloride a valuable dehydrating agent in certain types of dropsy and œdema, and it seems likely that ammonium chloride might have a similar effect without producing diarrhœa and malaise. It also appears that the therapy of acidosis should include a liberal supply of potassium and phosphates in cases where the kidneys have been in a position to excrete them.

Therapeutic Use of Ammonium Chloride.

The only serious therapeutic use of ammonium chloride so far has been in the treatment of tetany, where Freudenberg and György have used it with striking effect. In infantile tetany the symptoms vanish in a few hours, and satisfactory results have also been obtained in gastric and post-operative cases. In a series of infants treated with ½ g. per kilo per day of ammonium chloride the serum calcium rose from a mean value of 6·6 mg. per cent. to 8·9, the phosphorus falling from 4·9 to 2·9. In one American case ammonium chloride was given intravenously with success, but in view of its possible convulsant effects rectal administration would appear preferable when it cannot be given by the mouth.

The rationale of this treatment is the fact that tetany is always produced by forced breathing and sometimes by alkali ingestion. And although many cases may be due to guanidine poisoning, it is probable that even so a given amount of guanidine may be less effective when the calcium of the plasma is increased and its alkalinity diminished.

Many other facts of interest have arisen in the course of the investigations here summarised, notably with regard to oxygen consumption and the metabolism of organic phosphorus compounds, but their application to practical medicine is not yet clear. Moreover, a few of the results here given have only been obtained on a single individual, while their causation is often obscure. They seem, however, to point to therapeutic applications in many fields of medicine, and to testify to the value of experiments on men.

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HYDROPHOBIA IN EGYPT.

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THERE can be few medical schools in the world with such opportunities for the study of this disease as Kasr-el-Ainy in Cairo. Rabies is an endemic disease among the dogs, the jackals, and the desert wolves in Egypt. To this hospital are admitted all cases of animal bites of Egypt by order of the Ministry of the Interior. In all, the police bring some 2000 cases of animal bite a year; while probably just as many escape the police regulations. We have a medical school, a pathological institute, and an anti-rabic institute, modelled on the lines of the Pasteur Institute, all adjacent. Students enjoy the fullest opportunities of seeing the preparation of dried cords, and inoculation experiments in rabbits, as well as the clinical evidences of hydrophobia developing in our wards.

The clinical aspect of this disease is of the greatest value; for we can observe the earliest development of symptoms as well as the fully developed cases that come to the reception room. The number of cases of hydrophobia is about 15 a year; about half of which develop in hospital and the other half are admitted with symptoms fully developed. The anti-vivisectionists, whose excess of sympathy for the animal kingdom prompts them to oppose any scientific investigation based on animal experimentation, deny the existence of this disease either in animals or in human beings. In animals it is said to be one of the manifestations of sunstroke, and in human beings hysteria. Of all sweeping assertions none has less foundation than this. If one observes the children who develop hydrophobia in hospital one will be convinced that there is no question of suggestion with them. Our English sisters, who are the most experienced of us all in the recognition of this disease, fully bear out this opinion. The initial insomnia, the mental state, the rise in temperature, the terror that is so characteristic, and the gradual development through recognised stages to the fatal ending, should be sufficient to convince any sceptic. Again, in Egypt we have to deal with a simple, lowly-organised fellaheen population that is remarkably free from hysteria or functional disease in any of its manifestations.

Types of Animal Bites.

The worst animal bite is that of the camel. The lateral grinding movement of its jaw produces a compound fracture of the long bones; fractures even of the femur and tibia can be caused by camel bites alone, but the incidence of rabies in these animals is low. The rutting season in camels is associated with the development of foam around the mouth of the male; but this is essentially different from the dribbling saliva of the paralytic stage of the rabid camel. The next most serious bite is that of the pig. Though not associated with compound fracture, it is yet the most lacerating of all wounds; a pig can tear the hamstring muscles out of the human thigh. But the incidence of rabies also is low in the pig. From the point of view of the development of hydrophobia the bites of desert wolves and jackals (most jackals are incorrectly called wolves in Egypt) are the most dangerous. A jackal bites the throat and face particularly; and, in fact, the bite of this animal, when it cannot be killed and examined, must be looked upon as potentially liable to produce hydrophobia. The tendency for rabid animals to change their habits and character is responsible for

many of the attacks on human beings. A normal jackal does not frequent cultivated land in the day-time, and is usually so shy as never to attack human beings. By day he is in the rocks and holes of the desert hills. The mere fact of a jackal lying up in a sheltered spot in the fields in the day-time or attacking human beings is strongly suggestive of rabies. The first stage of rabies in our dogs is change of character, shown especially by the habit of standing in the hot sun in an aimless way. The second stage is that of violence, the biting of wood or any object, animate or inanimate, without reason. This is also associated with a tendency to hide behind a bush or in a fence. The third stage is the paralytic one, in which the dog is not really dangerous unless petted or caught. The jaw drops, the legs drag behind him, and saliva dribbles from his mouth, owing to the inability to close the jaws. Of all dogs the discarded hareem pet is most liable to infection. He is taken to the house to amuse the children when a puppy, then driven out when fully grown and forced to wander with no fixed duty or inclination at night-time, when he meets the rabid jackal and goes to see why the latter's movements are so peculiar. Sheep-dogs and house-dogs are not so often affected.

The position and character of the bite are of great importance. Deep lacerating wounds from the canine teeth of wolves or jackals are most dangerous, especially on uncovered areas of the body.

Our experience in Egypt differs from that of workers at Kasauli in India, or Buda-Pesth, or at the Pasteur Institute. The incidence of hydrophobia in our people admittedly bitten by rabid dogs is not so high, nor is the latent period of the development of the disease so prolonged. There is a curious belief in Egypt that if symptoms do not develop before the fortieth day after the bite, they will not develop at all. In our experience this is correct; for of all the cases of hydrophobia in Kasr-el-Ainy in the last four years not one developed it after the fortieth day. The average day was the nineteenth, whether the case was treated by injections of emulsion alone, or of emulsion and serum, or untreated in any way. In fact, the majority of the cases developing in hospital do so just before they are about to be discharged after the twenty-first daily injection. Our experience as to the development of hydrophobia is that 50 per cent. of untreated cases of admittedly rabid wolf-bites of the face develop symptoms of the disease; that 10 per cent. of these cases develop symptoms even if treated; but that of bites in general from all sources (and, of course, dog-bites are the most common) less than 1 per cent. develop the disease. The difficulty that confronts the compilation of all statistics of this disease is that of definitely knowing if the biting animal is rabid or not. The latter either escapes entirely or is shot; in the latter case his brain is usually destroyed and so decomposed by the time it reaches the Anti-Rabic Institute that inoculation experiments with rabbits are out of the question.

Diagnosis.

The diagnosis of hydrophobia can be made with almost certain accuracy from the clinical symptoms. The only absolute proof, of course, is the inoculation of filtered human saliva into the brain of a rabbit. Even then care has to be taken that a simple infective meningitis is not mistaken for rabies in the rabbit. The disease is a fascinating study. It is surrounded by an atmosphere of fear of infection among students, doctors, and attendants that is not in the least justified. Not one case of hydrophobia has ever developed in Kasr-el-Ainy among the attendants. One case, however, did develop in Egypt during the war, in an English sister who nursed a soldier suffering from what appeared, at first, to be epileptic fits. She died; but another sister who was equally exposed to infection did not develop the disease. Both were treated by emulsion and by serum.

In our hospital cases the first symptom is a rise in temperature and, for that reason, we watch the fever charts of our dog-bite cases very carefully even when the wound is healed. The next symptom, a very regular one, is insomnia; the patient sits up in bed all night and is disturbed mentally. These cases are nearly always diagnosed by the night sisters. Not, as a rule, until three days have elapsed from the development of these premonitory symptoms does the typical and so-called pharyngeal spasm develop. It is not a pharyngeal spasm at all; it is a spasm of the diaphragm. This symptom can be most aptly compared with the long shuddering inspiratory clonic spasm of the diaphragm that takes place when a child is immersed in cold water. All the accessory muscles of respiration in the neck stand out like cords, and the thorax is raised and fixed. But before this spasm, which is taken, quite rightly, as pathognomonic of the disease, develops, there is a curious and characteristic mental state of uniform and unmistakable terror. (Four other diseases in Egypt are also associated with fear; they are cholera, plague, tetanus, and angina pectoris.) A fear of some impending evil is written in the patient's eyes and in the facial expression; there is also an extreme anxiety to please, but at the same time a deterioration in intelligence. The wound begins to be painful, although it may have healed and there is no sign of inflammation. The patient is at first most amenable to suggestion or to any order, but it has to be repeated more than once. He is so ready to oblige that, if told to lie down in bed, he springs into the bed and betrays an excessive desire to be helpful and obedient. The voice is staccato in character, and we attach great importance to this symptom. This preliminary mental state is very characteristic. Later, usually within 24 hours, when the diaphragmatic spasm has developed, the diagnosis is beyond question; but then the violent terminal stage is near and the patient may soon be difficult to control. Before the stage of spasm it is possible to elicit the spasm of facial muscles and an inspiratory spasm by blowing upon the face. This is diagnostic at this stage and, later, also when the true diaphragmatic spasm has developed. It is a much more merciful, less painful and less distressing method of eliciting this symptom than to ask the patient to drink. When spasm has developed the swallowing of semi-solids is sometimes—and often in children—possible when the swallowing of liquid provokes spasm. Again, the sight of water alone provokes spasm; it is sometimes possible for the patient to drink from a rubber tube attached to a feeding cup in which no water is visible. Usually water in an open vessel induces immediate spasm.

In children, however, the symptoms are sometimes not classical, and these little patients may die without developing any spasm at all, and may drink in comfort up to the end. From the development of spasm the disease in adults lasts, as a rule, 48 hours; and death is due to a generalised neuritis and paralysis of the higher centres. But in children the disease may last five to seven days, and death may be sometimes accelerated by fluid starvation. Such is the disinclination, owing to the fear of infection on the part of some attendants, to apply the ordinary rules of nursing that one feels the want of fluid is partly responsible. In some of our cases, however, the patients have been given saline and nutrient enemata by the sisters to the end. Stomach-tube treatment is only possible under an anæsthetic, and is possibly quite ineffectual, inasmuch as the food appears to pass entirely indigested. The eyes become early inflamed, and muco-pus gathers in the internal canthus. Around the edges of the mouth dried mucus collects. The patient spits all over the floor.

The terminal violent stage is characteristic. The terror is most pronounced and suspicion is most marked. Often if one approaches alone it is possible to give a hypodermic injection; but if a crowd of attendants are present their fear and alarm is so easily conveyed to the patient that no efforts are of any avail. Until the final eight hours, when, as a rule, paralysis of the lower limbs develop and the patient drags himself about the floor, the violence is chiefly directed to climbing the walls of the strong room or

attempting to reach the embrasure of the window. All clothing is torn off, and the patients always die naked unless treated with hyoscine. The spectacle is a pitiable one. These patients, though inclined to crouch in a corner, are yet afraid of darkness. In their delirium they recapitulate the incidents of the dog or wolf attack, and they have delusions of vision and of hearing. They are always quieter in the light, either daylight or artificial. Children retain the remembrance of friendly faces almost until the end, and can be nursed and comforted by their accustomed nurses or sisters when the sight of a doctor rouses immediate terror. Usually, when the spasm has developed, symptoms of neuritis of the legs develop also, and knee-jerks and ankle-jerks and plantar reflexes are lost; in some cases the latter are exaggerated until the end. There is no change in the pupil reflex. The noises which are so often referred to as "dog-barking" or "wolf howls" have no foundation in fact whatsoever. They exist only in the imagination of observers. There is inspiratory phonation during spasm, and constant chattering during the violent stage. Later on, phonation is discordant and articulation is lost; but never can one observe any semblance to the howl of a wolf. Nor do patients ever attack or try to bite attendants; they only resist treatment. This disease, however, is clothed with so much exaggeration and fear of infection that any story is possible to a lively imagination.

Treatment.

Our treatment of the bite is by the cautery or excision or by caustics. Then, until the animal is definitely proved to be non-rabid, by emulsions of dried cords of rabbits daily for 21 injections. If the bite is a severely lacerated one or a definite wolf-bite, or situated upon the face, the treatment given is by serum as well as by glycerine emulsion.

Our treatment of the symptoms is by hyoscine and morphia; then, when violence is controlled, the treatment that we adopt for the disease itself is the intravenous injection of novarsenobenzol or tartar emetic. This is largely empirical, on the presumption that we may have to deal with a filter-passing virus of the nature of that causing horse-sickness. But we have had no successful results to publish—unless it be one doubtful case that recovered, in whom the disease may have been aborted by an injection of 606. He exhibited the characteristic mental state, and spasm of the facial muscles could be elicited by blowing upon the face, but he had not developed the true diaphragmatic spasm. Steps are being taken to undertake inoculation experiments in rabbits with filtered saliva in all our doubtful cases.

The treatment of the disease, however, must be commenced at once. As swallowing is usually impossible and rectal treatment is not tolerated, recourse must be had to hypodermic injection. In some cases of children, without spasm, sulphonal in 3 gr. doses is effectual in controlling violence, but in adults hyoscine is the drug and the only drug. Morphia alone is useless; but when combined with hyoscine in doses of 1/50 gr. the violence is controlled and the patient can be nursed in a bed.

We have had no cases among Egyptians of hysteria simulating this disease or of the mimicry of symptoms in order to obtain sympathy or to base a claim for compensation; but we hear of one European who developed hysterical spasm of the pharyngeal muscles on his way down from Khartoum to Cairo for treatment. Rabies, by the way, is very rare indeed among the dogs or jackals in the Soudan.

Our pathological investigations into this disease are disappointing. Even in undoubted and fatal clinical cases of hydrophobia we only find Negri bodies in 20 per cent., either in the blood or in the region of the hippocampus major of the brain. The mortality is 100 per cent. as far as we know. But until we begin to inoculate rabbits as a routine method with filtered saliva we shall never be sure that some of our recovered cases with mental symptoms and signs of a peripheral neuritis are not, in fact, cases of cure or cases of hydrophobia modified by treatment.

We are indebted to Mr. A. E. Branch, Director-General of the Veterinary Service, for the following statement and figures of rabies prevention in Egypt:—

Eighty-one cases of rabies were reported during the year 1922, against 120 cases in the previous year.

The total number of dogs and cats destroyed during the year was 103,000—distributed as follows: Provinces, 74,416; Cairo, 13,543; Alexandria, 5966; Dogs' Home, Boulac, 9075. The Cairo police seized and sent to the Dogs' Home, Boulac, 10,988 dogs, of which number 9075 were destroyed.

The total number of animals placed under observation was 455, classified as follows: Dogs 400, cats 27, monkeys 20, horses 2, camels 1, donkeys 3, foxes 1, weasels 1.

MALARIA THERAPY IN GENERAL PARALYSIS OF THE INSANE.

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DURING the past few months several articles on the treatment of general paralysis of the insane by inoculation with malaria have appeared in the medical press of this country, but, so far as we have seen, no detailed report on the reactions of the blood and cerebro-spinal fluid after treatment has been published. In this preliminary report we propose to deal with our observations on the blood and cerebro-spinal fluids (C.-S.F.) of 40 cases treated at the County of Lancaster Mental Hospital, Whittingham. For one reason or another it was not possible to apply all the tests in some of the cases, but comparisons have been drawn wherever possible.

Of the 40 cases reported on, 16 had a course of preparations of salvarsan after the malaria had been arrested by the administration of quinine. In these cases the blood and C.-S.F. were not examined until at least one month after the administration of the last dose of salvarsan. In some cases several examinations of the blood and fluid were made to investigate the possibility of progressive changes in the findings. In all, 49 C.-S.F. examinations and 46 blood examinations were made after treatment. Of the 40 cases we review, in 40 per cent. the fluid was examined during the first month after treatment had been stopped, in 10 per cent. during the second month, in 30 per cent. between the third and sixth month, and, finally, in 20 per cent. between the sixth and thirteenth month. The accompanying table contains a synopsis of the readings of the C.-S.F. and blood reactions both before and after treatment.

1. *Colour.*

Xanthochromia occurred in one of our series (Case 33). Lumbar puncture two days following the disappearance of the *Plasmodium vivax* from the circulating blood revealed a yellow fluid, intensely stained, even following prolonged centrifugalisation at a high velocity. Spontaneous coagulation or a marked increase in protein was absent, whilst the chemical tests for bile gave consistently negative results. A microscopic examination of the centrifuged deposit revealed broken-down and effete red cells and granular debris. The colour persisted for a short time only, as a series of punctures at intervals of a few days manifested a gradual diminution in its intensity with final disappearance of all colouring matter at the end of 14 days.

2. *Cytology.*

A decrease in cells was an early change noted in 91·5 per cent. of 37 fluids examined. In this series they varied in number from 1·6 to 61 cells per c.mm. and were uniformly made up of small and large

lymphocytes, the large cell predominating. The decrease in the number of cells per c.mm. worked out as follows: between 0 and 5 cells per c.mm., 24·3 per cent.; between 5 and 10, 32·4 per cent.; 10 and over, 35·1 per cent. An actual increase took place in 8·2 per cent.

3. *Protein.*

A lowered protein content, as estimated by the ring test of Ross-Jones and the reaction of Pandy, was another early feature in the 49 per cent. of cases in which this phenomenon occurred. No change was observed in a little less than 45 per cent. of the series.

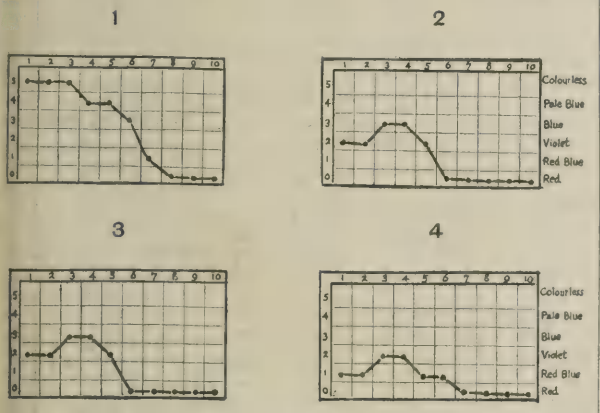
4. *Cellular Decrease with Lowered Protein Content.*

This combined change was seen in 64·8 per cent. of all treated cases. Comparisons were not made in those instances where red blood corpuscles were demonstrated by the microscope.

5. *The Colloidal Gold Reaction of Lange.*

The gold solution was prepared according to the method of Miller, Brush, Hammers, and Felton.[1] Each fresh supply of the reagent was tested before use with known normal and known general paralytic fluids, and the tests were carried out in the usual manner. In all cases the lumbar fluids were examined within an hour of their withdrawal. The readings were made in daylight and charted after the tubes had been allowed to stand at room temperature for 12 hours.

In expressing the results, the numeral 5 is used to indicate complete decolorisation due to complete



Case 21.—1. Curve before treatment, Nov. 2nd, 1922. The parasites disappeared May 2nd, 1923. 2. Curve on Sept. 7th. 3. Curve on Oct. 15th. 4. Curve on Dec. 14th.

precipitation of the colloidal gold, whereas the numbers 4, 3, 2, and 1 indicate the colours of pale blue, blue, violet, and red-blue respectively. No change in colour is represented by 0. The "paretic" curve shows complete decolorisation in the first few tubes (three or more), with lesser colour changes in the remainder, giving a reading such as 5555543210. Incomplete precipitation, but with general conformation of the curve, represented by a reading as 4444321000, would still be regarded as fairly typical. The "mid-zone" or "luetic" curve shows no change in the first one or two tubes, with the maximum colour reaction in the fourth or fifth tubes giving a reading as 0012211000.

The test was performed in the whole series of our cases and repeated at varying intervals in a few instances where a marked change in the reading first appeared. In this way we were able to observe and to follow the conversion of a typical "paretic" to a "luetic" curve. In none of our cases can we say that an absolute negative gold solution resulted from the malarial treatment. In 28 fluids, or 70 per cent. of the cases, the "paretic" curve remained unchanged, whilst in nine fluids, or 22·5 per cent., the "paretic" curve persisted, clouded, however, by a slight colour change. The first three or four tubes in these cases appeared as though the gold solution had been completely precipitated, except for a faint bright-pink coloration which we have expressed in the table as { 5555 / 4444432000.

"Luetic" curves were demonstrated in three fluids (Case Nos. 4, 21, and 39), or 7·5 per cent. of the series. Case 21 is very helpful in observing the changes through which the colours pass in the conversion of a "paretic" to a "luetic" curve. (See charts.)

6. *The Colloidal Gamboge Reaction.*[2]

The colloidal gamboge reaction was introduced as one of the routine tests of the C.-S.F. in our laboratory in the early months of 1922, when Riddel and Stewart found that by using a colloidal suspension of gamboge they were able to obtain "paretic" curves in 100 per cent. of the cases of general paralysis. Briefly the test is interpreted as follows: A negative reaction is shown by a total absence of precipitation in all six tubes and would be indicated in numerals with the reading 000000. Complete precipitation of the gamboge (indicated by the numeral 2) in the first three or more tubes is known as the "paretic" curve. This curve, seen in all our untreated cases of general paralysis, is represented by the reading 222220. Partial precipitation (indicated by the numeral 1) in the first three tubes, the "luetic" curve, is a fairly constant reading in cases of meningo-vascular syphilis. It reads 111000. In meningitis, complete precipitation occurs in the higher dilutions (tubes 4 and 5), tubes 1 and 2 usually remaining negative. The colloidal gamboge reaction in a recent case of pneumococcal meningitis (confirmed by autopsy) gave the reading 112220. The test was carried out with all the fluids of the series and the following observations were made. The "paretic" curve remained unchanged in 32 cases, or 80 per cent.; showed a slight change in seven cases, or 17·5 per cent.; whilst a "luetic" curve resulted in one case, or 2·5 per cent. of the series. A negative reaction was not obtained. In comparing the values of the two colloidal tests as an indication of changes in the C.-S.F. following the malaria treatment, it will be seen from these results that the percentage change in the gold solution (30 per cent.) was higher than the corresponding change (20 per cent.) in the gamboge reaction.

7. *The Wassermann Reaction of the Cerebro-spinal Fluid.*

Comparisons were possible in 29 fluids, as in this number of cases had records been kept both before and after treatment. In this series three became negative, six weakly positive or doubtful, whilst 20 remained unchanged. In the 11 cases where the W.R. was not obtained before treatment three negative findings occurred, making a sum total of six, or 15 per cent., negative serum reactions of the whole series.

8. *Wassermann Reaction of the Blood.*

The same difficulties as with the C.-S.F. allowed us to make comparisons in the readings of only 24 sera. A reduction in the intensity of the reaction was an early feature of the treated cases, and accounted for 17 of the 24 sera examined. Five remained unchanged, whilst two became negative. In all 40 cases, 23, or 57·5 per cent., were weakly positive or doubtful, and three, or 7·5 per cent., were negative. The W.R.'s of the C.-S.F. and blood were concurrently negative in two cases; three of the six negative W.R.'s of the C.-S.F., and all three of the negative blood W.R.'s, occurred in cases treated by salvarsan. Likewise to the two cases where the blood and C.-S.F. W.R.'s were concurrently negative salvarsan had been given.

Early changes observed were diminished protein content and a decrease in lymphocytosis of the fluid, and a reduction of the W.R. of the blood. A combina-

[1] Miller, Brush, Hammers, and Felton: Bull., Johns Hopkins Hosp., 1915, xxvi., 391.

[2] Riddel and Stewart: Journal of Mental Science, October, 1922.

Case No. and Sex.	Stage of disease.	Age.	Date of disappearance of parasites.	Dates of taking specimens.	Ross-Jones' R.	Pandy R.	No. of cells per c.mm.	Lange colloidal gold test.	Colloidal gamboge test.	Wass. R. C.-S.F.	Wassermann R. Blood.	Remarks.
1. M	L	42	—	20/7/22	+ +		47	5555555443	222210	+ +	+	
			11/9/22	22/10/23	f. +	f. +	18·3	5555422000	222210	+	+	
2. M	L	36	—	20/7/22	+ +		69	5555554421	222110	+ +	+	
			11/9/22	22/10/23	+	f. +	119	{554 {4433220000	221000	+	Weakly +1 in 5	
3. M	L	42	—	10/8/22	+ + +		44	5555555420	222210	+ +	+ 1 in 40	
			6/9/22	22/10/23	f. +	f. +	2·3	5554320000	221000	+	Weakly +1 in 4	
4. M	E	38	—	7/8/22	+ +		196	5555554100	222110	+	+1 in 5	
			6/10/22	24/7/23	f. +	f. +	61	0013300000	221000	+	+1 in 5	S.
5. M	L	58	—	4/11/22	+ +		64	5555543310	222110	+	+	
			23/1/23	22/10/23	+	f. +	13	5555432000	222210	+	Weakly +1 in 4	S.
6. M	E	34	—	1/2/23	+	+	62	5555532200	122220	+	N.D.	
			19/4/23	22/10/23	f. +	f. +	4·6	{554 {4433320000	221000	Doubtful	+1 in 15	
7. M	L	41	—	29/3/23	+	+	53	5555543200	222210	+	N.D.	
			30/5/23	23/10/23	+	+	6·3	{555 {4444320000	222100	+	+1 in 10	
8 M	L	43	—	9/1/23	+ +	+ +	11	5555543300	222210	+	N.D.	
			17/7/23	23/10/23	+	+	3	5555422000	222110	Neg.	Doubtful 1 in 2	S.
9. M	E	41	—	8/6/23	+	+	169	5555554320	222220	+	+1 in 40	
			11/8/23	23/10/23	+	+	15	{5555 {4444432000	222210	+	Doubtful 1 in 2	S.
10. M	E	30	—	26/4/23	+	+	18	5555554320	222220	+	+1 in 40	
			11/8/23	23/10/23	+	+	11·3	5555422000	222220	+	Weakly +1 in 5	S.
11. M	L	38	—	24/1/23	+ +	+ +	26·3	5555554320	222220	+	+	
			23/8/23	23/10/23	+	+	6·6	5555432000	222210	+	Doubtful	
				13/9/23							+1 in 15	S.
12. M	E	41	—	28/5/23	+	+	20·3	5555543200	222220	+	+	
			16/9/23	23/10/23	+	+	9	{555 {4444320000	222210	Neg.	Neg.	
				13/9/23							Doubtful 1 in 2	S.
13. M	L	38	—	14/8/23	+	+	56·3	5555432000	222100	+	N.D.	
			16/9/23	25/10/23	+	f. +	4	{555 {4444320000	221000	Neg.	Neg.	
				13/9/23							Neg.	S.
14. M	L	44	—	16/2/23	+ +	+ +	178·6	5555554320	222220	+	+1 in 45	
			16/9/23	25/10/23	+ +	+ +	18·3	5555554320	222220	+	+1 in 45	S.
15. M	E	54	—	31/5/23	+	+	15	5555432000	222220	+	N.D.	
			29/9/23	23/10/23	+	+	24	5555432000	222220	+	Doubtful	
16. M	E	57	—	7/6/23	+	+	35·6	5555432000	222210	+	N.D.	
			14/10/23	26/10/23	+	+	16	5555543200	222220	+	+1 in 10	
17. M	L	45	—	15/6/23	+	+	37	5555555430	222220	+	N.D.	
			23/10/23	26/10/23	+ +	+ +	18·6	5555543200	222220	Doubtful	Doubtful	
18. M	E	39	—	23/4/23	+	+	68	5555543200	222220	+	N.D.	
			30/10/23	1/11/23	+	+	27	5555554320	222220	+	Weakly +1 in 8	
19. F	L	46	—	5/6/23	+	+	33·6	5555543000	222210	+	N.D.	
			20/7/23	8/1/24	+	+ +	5·3	5543210000	222220	+	Strongly +1 in 25	
20. F	Juv. G.P.I.	20	—	22/7/22	+ + +		279	5555555543	222220	+	+1 in 40	
			28/1/23	8/11/23	f. +	f. +	9	5555420000	222100	+	Weakly +1 in 8	
21. M	L	38	2/5/23	2/11/22	+		106	5554431000	222110	N.D.	N.D.	
				7/9/23	f. +	+	1·6	2233200000	211000	Doubtful	N.D.	
				15/10/23	f. +	+	4	2233200000	210000	Neg.	N.D.	
				14/12/23	−	+	0·6	1122110000	100000	Neg.	Weakly +1 in 5	
22. M	L	53	14/6/23	6/6/22	+ +	+	39	5555544320	222210	N.D.	+1 in 15	
				17/9/23	f. +	+	8·3	5555432000	222210	+	+1 in 10	
				25/10/23	+	f. +	4	5555432000	222210	+	+1 in 10	
23. M	L	52	17/8/23	7/9/22	+ +	+	71	5555555432	222220	N.D.	N.D.	
				26/10/23	+ +	+ +	14·6	5555543200	222220	+	+1 in 15	S.
24. M	L	51	26/11/23	26/10/23	+ +		43	5555543000	222220	+	+1 in 25	
				20/12/23	+	+	7·3	5554321000	222210	Doubtful	Weakly +1 in 5	
				8/1/24	+	+ +	9	5555321000	222220	,,	N.D.	
25. M	L	35	6/3/23	1/11/22	+		24	5555543100	222110	N.D.	N.D.	
				1/11/23	f. +	+	40	5555543200	222210	+	+1 in 15	
26. M	L	44	11/7/23	6/2/23	+ +	+ +	43·6	5555543320	222220	N.D.	+	
				1/11/23	±	+	20	5555432000	222100	Doubtful	+1 in 5	S.
				18/9/23						Neg.		
27. M	L	44	3/7/23	2/11/22	+ +		r.b.c.	5555433100	222220	+	+	
				1/11/23	f. +	+	3	5555543200	222100	+	Neg.	S.
28. M	L	52	1/7/23	20/12/21	+ + + +	+ +	61	5555555530	222200	N.D.	+	
				1/11/23	+	+	3	5555554320	222220	+	Weakly +1 in 5	
29. M	L	54	1/7/23	1/11/22	+	+	36	5555543100	222110	N.D.	+	
				1/11/23	f. +	+	5·3	5543220000	222000	+	Weakly +1 in 3	S.
30. M	L	37	25/7/23	13/2/22	+ +	+	44	5555321000	222110	N.D.	N.D.	
				1/11/23	±	f. +	5·3	5555432000	221000	+	+1 in 5	S.
31. M	L	44	12/5/23	27/6/22	+ +		34	5555555553	222220	N.D.	N.D.	
				5/11/23	f. +	+	11	555543200	222110	+	+1 in 45	
32. M	L	56	28/10/23	4/9/23	+ +	+ +	80·6	5555542000	222220	+	+	
				5/11/23	+	+	33·6	5555554320	222210	+	Weakly +1 in 5	
33. M	E	35	6/11/23	7/9/23	+ +	+ +	36	5555543200	222220	+	N.D.	
				8/11/23	+ +	+ +	r.b.c.	5555553200	222220	+	Weakly +1 in 4	S.*
				15/11/23	+	+	9	5555554200	222220	+	,,	S.*
				22/12/23	+	+	4	5554321000	222210	+	,,	S.†
34. M	E	51	3/12/23	26/9/23	+ +	+ +	26	5555432000	222220	+	+1 in 20	
				20/12/23	+	+	4·6	5555432100	222220	N.D.	+1 in 15	
				8/1/24	+ +	+ +	13·3	5554431000	222220	+	+1 in 15	
35. M	L	43	8/12/23	12/11/23	+	+	147·3	5555421000	222110	+	+1 in 15	
				20/12/23	+	+	8·3	{53 {5423211000	221000	+	+1 in 15	
36. M	L	47	20/12/23	12/11/23	+ +	+ +	48·6	5555542100	222220	+	+1 in 45	
				20/12/23	f. +	+	4·3	5555432100	222220	+	+1 in 45	
37. M	L	44	29/12/23	7/9/23	+ +	+ +	23	5555432000	222210	+	+1 in 15	
				30/12/23	+	+	r.b.c.	5555542100	222220	N.D.	N.D.	
38. M	E	44	—	15/10/23	+	+ +	103·6	5555433000	222220	+	+1 in 15	
			10/1/24	11/1/24	+	+ +	26	5555543100	222210	+	Weakly +1 in 5	
39. M	L	42	—	7/9/23	+	+	32	5555432000	222210	+	+1 in 15	
			30/11/23	20/12/23	f. +	+	6	5443211000	222100	+	+1 in 5	
				8/1/24	+ +	+	7	1112100000	222100	+	N.D.	
40. F	L	35	—	1/9/21	+ +	+ +	14	5555544200	222210	N.D.	+ +	
			30/8/23	10/9/23	+ +	+ +	r.b.c.	5555543200	222220	Neg.	Weakly +1 in 3	

First line in each case represents the readings in the fluid and blood before treatment.
S = Case treated by malaria inoculation and salvarsan. S* = Xanthochromia. S† = Clear and colourless. E = Early case.
L = Case in late stages. f. + = faintly positive. N.D. = Not done. M = Male. F = Female.

tion of all three changes occurred in 16, or 40 per cent., of the whole series of cases. Of the 16 cases treated with salvarsan seven, or 43·7 per cent., of this series provided the same combination of changes. We were able to make further observations on the changes in the C.-S.F. in a series of 29 fluids where all the reactions had been carried out both before and after treatment:

(*a*) In six cases (vide cases Nos. 1, 3, 6, 8, 13, and 24), or 20·3 per cent., there were present in the fluid a lowered protein content, a cellular decrease, and a reduction in the fluid W.R.

(*b*) In two cases (vide cases Nos. 6, 13), or 6·7 per cent., there were seen in the fluid a lowered protein content, a cellular decrease, a reduction in the fluid W.R., and slight to marked changes in the gold-sol test. The gold-sol test was the last of the fluid reactions to show any change.

Salvarsan had been given in three of the six cases discussed in the subchapter (*a*) and to one of the cases mentioned in subchapter (*b*).

Summary.

In a series of 40 cases of general paralysis treated by inoculation with malaria, 16 of which received in addition a course of salvarsan, observations were made on the findings in the C.-S.F. and blood, and comparisons made where possible. As the times of the withdrawal of fluids following the fever treatment varied from one day to 13 months, we were able to observe whether immediate changes, if any, progressed or remained stationary.

No improvement in any of the cerebro-spinal fluid reactions occurred in one case—No. 15. It will be seen, however, that the W.R. of the blood was returned as doubtful, so that in reviewing the changes of the whole series of the liquor and serum reactions we obtained in *every* case some alteration either in the fluid or serum or in both following treatment.

The earliest signs of improvement were manifested by a diminished lymphocytosis and lowered globulin content of the C.-S.F. and by a reduction in the intensity of the blood W.R. First, the lymphocytes in the fluid decreased (91·9 per cent.); secondly, the blood W.R. diminished in intensity (65 per cent.); and then the protein content of the liquor became less positive (49 per cent.). A combination of all three changes occurred in 40 per cent. of the series.

The W.R. of the C.-S.F., the colloidal gamboge reaction, and the colloidal gold test were favourably influenced at a somewhat later period. The changes in order of frequency were W.R. of C.-S.F. 30 per cent., colloidal gold 30 per cent., and colloidal gamboge 20 per cent. A combined improvement in the globulin and cellular content and W.R. of the fluid occurred in 20·3 per cent. of all cases. Including the gold-sol test there was a combined improvement in 6·7 per cent. Negative W.R.'s were obtained in the C.-S.F. and the blood in 15 per cent. and 7·5 per cent. of the respective series. In two cases, or 5 per cent., were the liquor and serum W.R.'s concurrently negative.

Taking the 16 salvarsan cases as a separate series, the following percentages of readings of improvement in both fluid and serum were estimated: (1) diminished pleocytosis, 100 per cent.; (2) serum W.R. reduction, 68·7 per cent.; (3) lowered protein content 46 per cent. Combined changes (1, 2, and 3) occurred in 43·7 per cent.

Combined improvement in the cell count, protein content, and W.R. of C.-S.F. took place in 18·7 per cent., and with the gold-sol test in 6·2 per cent. of the whole series. The W.R.'s of the C.-S.F. and the blood serum were negative in 25 and 18·7 per cent. respectively—concurrently in both in 5 per cent.

We beg to acknowledge our indebtedness to Dr. R. M. Clark, medical superintendent of the hospital, for permission to place on record the results of these investigations. The Wassermann reactions of cerebro-spinal fluid and blood were kindly carried out for us at the Public Health Laboratory, Manchester, under the direction of Prof. W. W. C. Topley.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

JOINT MEETING OF THE SECTIONS OF MEDICINE, SURGERY, AND THERAPEUTICS AND PHARMACOLOGY.

AT a joint meeting on March 5th, Mr. CYRIL A. R. NITCH (President of the Section of Surgery) in the chair, a discussion was held on the

TREATMENT OF GASTRIC AND DUODENAL HÆMORRHAGE.

Mr. HERBERT J. PATERSON, opening the discussion, said that the surgical treatment of hæmorrhage from gastric and duodenal ulcers might be discussed in reference to two distinct groups of cases, the sudden acute hæmorrhages, threatening life itself, and chronic or recurrent hæmorrhages, less alarming in extent, but tending to produce a profound anæmia, which, if unchecked, might ultimately prove fatal. From a surgical point of view this classification seemed preferable to that in which a distinction was drawn between hæmorrhage from a so-called acute ulcer and hæmorrhage from a chronic ulcer, because it was not known that there was such a pathological distinction, and, if there were, it could not be recognised clinically. The duration of symptoms had no relation to the chronicity of an ulcer as seen in the operation theatre.

Acute Hæmatemesis.

Although aware of the danger of laying down hard-and-fast rules, he believed there should be no such thing as surgical intervention in cases of acute hæmatemesis—that operation during the progress of gastric or duodenal hæmorrhage should never be attempted. The collapse induced by loss of blood was favourable for arrest of hæmorrhage, but unfavourable for surgical intervention. It could usually be arrested by medical treatment; such patients, if subjected to operation, were exposed to added dangers, whereas without operation the probability was that they would recover. Two questions arose in this connexion: (1) the mortality-rate from hæmorrhage in cases treated medically, and (2) the mortality-rate in cases treated by immediate operation. Most clinicians were agreed that the mortality-rate from hæmorrhage in cases of gastric and duodenal ulcer treated medically was under 5 per cent. In the four series of cases collected by Lenhartz, Ewald, Wirsberg, and H. P. Hawkins the average mortality-rate was 3·8 per cent. With regard to the mortality-rate of the cases treated by immediate operation, Lindberg, in 1914, tabulated 83 cases with 30 deaths, a mortality-rate of 36 per cent. Those statistics might be called out of date, and more modern technique, especially with blood transfusion, might be claimed to secure better results at present, but he was not clear that there was ground for this optimism; at any rate, the results of surgical treatment were still indubitably inferior to the results of medical treatment. Through the courtesy of the surgical registrars of some of the London hospitals he had obtained some statistics as to immediate operation for acute hæmatemesis in recent years. In 19 cases there were 7 deaths (mortality-rate 36·8 per cent.). Obviously it was unfair to compare these figures with the mortality-rate in all cases of ulcer, whether they bled or not; they must be compared with the mortality-rate in severe cases of hæmatemesis. Hæmorrhage occurred in at least two-thirds of all cases of gastric ulcer, and was severe or recurrent in about 30 per cent. Calculated on this basis the mortality-rate of cases with severe or recurring hæmorrhage treated medically would be about 11 per cent. He thought this was probably an exaggeration, but it would be well within the mark to state that of the patients who bleed severely or repeatedly and are treated medically not more than 1 in 9 would die, while of those treated by immediate operation 1 out of 3 would probably die. No doubt

some surgeons by superior skill, aided by a considerable share of luck, might be able to show much better individual results than these. He said "aided by luck," for in a given case it was impossible to predict whether one could find, let alone deal with, the source of the bleeding.

A Series of Cases Personally Treated.

Apart altogether from statistics, he was convinced that the treatment of acute hæmatemesis by medical means was the wiser and safer course. It could not be emphasised too strongly that patients rarely died of a first hæmorrhage; repetition was the important thing. As for the argument: "This patient is bleeding; he will probably die; something must be done"—even were the premises true, he saw no reason for doing something which would probably make the patient's life shorter still. The case was quite different in acute intestinal obstruction, where without surgical intervention death was inevitable, so that operation was justifiable even in desperate cases. In hæmatemesis, on the other hand, operation might be the last straw for a patient who otherwise might recover. Up to the end of 1921 he had had under his care, or jointly with Dr. Soltau Fenwick, 40 cases where hæmatemesis was so severe that the patients were on the point of death, but all of them recovered with medical treatment; indeed, he had yet to see a death from hæmatemesis from a gastric or duodenal ulcer. All these patients were first treated medically, and in all but two gastro-jejunostomy was performed two or three months later. In four cases he could find no ulcer; the hæmorrhage was probably secondary to a diseased appendix; these were among his very early cases, and he now admitted that the gastro-jejunostomy was a totally unnecessary complication of appendicectomy. One patient had a slight hæmatemesis two months after operation, and no subsequent recurrence up to the time of death three years later from causes unconnected with the gastric condition. Another patient was readmitted into hospital a year after discharge in a moribund condition from a perforated jejunal ulcer. Thus the immediate operative mortality in this series was nil, and all but two of the patients were apparently cured.

Medical Treatment of Acute Hæmatemesis.

As regards the medical treatment of acute hæmatemesis, the important points were: (1) Absolute rest in bed; (2) Tripier's hot-water injections by the rectum (saline at 120°–130°F.); (3) an ice-pack to the abdomen; (4) nothing given by the mouth for at least four days, milk diet for two months, when some diluted beef essence might be added to the dietary; (5) small doses of morphia were valuable; (6) daily subcutaneous injection of a 10 per cent. solution of sterile gelatin in 40 c.cm. doses; (7) if vomiting or hæmatemesis continued the stomach should be washed out very gently with warm water, and after the lavage a dose of crystalline bismuth subnitrate given through the tube. It used to be taught that in hæmorrhage from the so-called acute ulcer, subsequent operation was unnecessary unless bleeding recurred, but the only safe rule was that an acute hæmorrhage required surgical treatment to prevent recurrence. The interval between the hæmorrhage and operation should be at least three months; if the patient was still anæmic transfusion of blood before operation was a valuable adjuvant.

Chronic or Recurrent Hæmatemesis.

For chronic or recurrent hæmorrhages operation should, as a rule, be deferred for two or three months after the last hæmorrhage, according to the patient's condition, medical treatment being carried out meanwhile. In large excavating ulcers, septic processes in the ulcer might play a considerable part in causing the hæmorrhage, so that it was important not only to rest the stomach but to keep it clean. If, *in spite of absolute rest*, there was further recurrence, operation might be considered, although personally he had never had to depart from his usual practice of delaying operation for two or three months. Operation, if decided upon, should be preceded by blood transfusion. There would probably be considerable difference of opinion as to the nature of the operation which should be performed for recurrent hæmorrhage. Ligature of arteries, excision of the ulcers, cauterising the ulcer combined with gastro-jejunostomy and partial gastrectomy had been employed; personally, he still pinned his faith to gastro-jejunostomy.

Some objected to gastro-jejunostomy on the ground that it was an indirect method of treating hæmorrhage, but it was the simplest surgical procedure to adopt, and had the great advantage that one started with a definite plan and was not tempted to do an extensive exploration which might turn the scale against recovery. If it failed it was time enough to adopt more drastic measures. He had had, alone or with Dr. Fenwick and Dr. Porter Parkinson, 84 cases in which there were recurrent attacks of severe hæmatemesis. In 82 of these hæmorrhage was due to a gastric or duodenal ulcer, and in all gastro-jejunostomy was performed. There were three deaths in this series, so that adding the 38 cases of gastro-jejunostomy before mentioned, there were three operative deaths in 120 operations, a mortality-rate of 2·5 per cent. In 4·2 per cent. there was a recurrent hæmorrhage of a trivial character, and in 90 per cent. no further hæmorrhage occurred after gastro-jejunostomy. He submitted that these figures justified the treatment adopted. He would offer one word of advice to his younger hearers: When called upon to treat a patient with hæmatemesis, they should take their courage in both hands and trust nature.

Discussion.

Sir WILLIAM WILLCOX said that no definite rule could be laid down for the treatment of severe gastric and duodenal hæmorrhage; the ætiology of each case must be separately considered, and treatment based on the provisional diagnosis. Some of the most severe hæmorrhages he had seen were in cases of cirrhosis of the liver, gastrostaxis, &c., in which the treatment usually adopted for a bleeding peptic ulcer might be contra-indicated. Certain principles of treatment might, however, be laid down, such as rest of the stomach and duodenum; he agreed with Mr. Paterson as to the danger of operation in the acute stage. Nothing should be given by the mouth for the first two or three days, or four or five days if hæmorrhage had been severe. With regard to local applications, he doubted whether the application of an ice-bag over the epigastric region was of much value. Morphine and its derivatives were undoubtedly useful; morphine was a powerful remedy for the control of peristalsis, but where hæmorrhage resulted from hepatic cirrhosis (due to alcohol, syphilis, &c.) the patient was strongly susceptible to the toxic action of these remedies, and the ordinary dose of ¼ gr. of morphine might cause death. Hepatic cirrhosis, and also chronic nephritis, contra-indicated the use of morphine; signs of hepatic or renal insufficiency should be sought before recourse was had to this drug. Another important factor in treatment was the promotion of the power of coagulation of the blood. He had adopted as a routine measure the intramuscular injection into the buttock of 1 gr. calcium chloride dissolved in 100 minims of distilled water. Serum injections were also useful; when a toxic cause was suspected, anti-streptococcic serum should be given. Blood transfusion was also of great value in counteracting hæmorrhage, and in some cases inhalations of carbon dioxide had been used with success.

Mr. A. H. BURGESS divided gastric and duodenal hæmorrhage into two types, one post-operative, the other arising from disease and independent of any operative procedure. Post-operative hæmorrhage followed operation (*a*) upon the stomach or duodenum, or (*b*) upon some other part of the body. In the former case prevention was more satisfactory than cure, and he stressed the importance of two points of technique: (1) All large vessels approaching the line of incision of the stomach should be under-run

with a suture and ligatured; and (2) the inner continuous layer of suture, taking up all the coats, should be closely applied, the needle passing ten times to the inch, and being drawn tightly. After gastro-enterostomy or partial gastrectomy, if the patient vomited, the vomited matter would always contain blood more or less altered, and usually already dark brown in the first vomit. If hæmorrhage continued the vomit would be brighter red; if this colour persisted and was associated with a rising pulse-rate some treatment should be adopted. He had seen three cases only which gave anxiety on the score of immediate post-operative hæmorrhage; the latter had ceased after the introduction of very hot water into the stomach—a method first introduced, he believed, by Rodman. The only fatal case he had had was after gastro-enterostomy for irremovable carcinoma of the pylorus; the main stem of the pyloric artery was shown post mortem to have been eroded in the floor of the malignant ulcer. Post-operative hæmorrhage after operations elsewhere than in the stomach and duodenum was rare, but had been met with after operations on almost all the abdominal viscera, and also elsewhere in the body. The mortality was high, having been put at 55 per cent.; the ætiology was obscure, but Rodman's view of a septic origin was generally accepted. Gastric or duodenal hæmorrhage other than post-operative might be grouped as associated, or not associated, with any gross local lesion in either viscus. Profuse hæmorrhage (gastrostaxis) might occur in the absence of such a lesion. He had three times operated for severe hæmatemesis without finding any gross lesion of stomach or duodenum. He had concluded that severe hæmorrhage from these viscera should not be surgically treated unless previous knowledge of the case, or definite relation of pain to the taking of food, pointed to a gross local lesion. Profuse hæmorrhage from chronic gastric ulcer was usually either quickly fatal from erosion of a large artery, or, if once arrested, did not tend to recur soon and repeatedly, as did that from a duodenal ulcer. He had no belief in "indirect" arrest of hæmorrhage by gastro-enterostomy. If operation were undertaken at all it should be a direct attack on the bleeding ulcer—its separation from pancreas or liver, and its destruction by excision or cautery.

Dr. A. F. HURST believed that hæmorrhage from gastric and duodenal ulcers was far less often fatal than was generally supposed. He had never had a case where death resulted, and only once had he had to call in a surgeon to save the patient's life. Dr. J. J. Coneybeare had investigated the post-mortem records of all cases of fatal hæmorrhage from gastric and duodenal ulcers (in the absence of cirrhosis of the liver) at Guy's Hospital between 1911 and 1920 inclusive. The total number was 23—i.e., 2·6 deaths a year if allowance was made for the fact that no post-mortem examinations were made in 12 per cent. of patients dying in the hospital. The 23 autopsies constituted 0·37 per cent. of the total number performed in the ten years. Only 13 of the 23 died from hæmorrhage without having undergone some previous operation; as about 600 cases were admitted, during the period in question, for hæmorrhage from an acute or chronic ulcer, the mortality of severe gastric and duodenal hæmorrhage was about 2·5 per cent. The most important factor favouring the cessation of this hæmorrhage was complete immobility; the patient should be reassured about his condition, and should be given repeated doses of morphia to keep him drowsy. Complete starvation for 48 hours should be secured, after which the ordinary strict treatment with diet, alkalies, belladonna, and olive oil should be begun. When hæmorrhage was severe, the rapid distension of the stomach resulted in more or less complete evacuation by hæmatemesis, followed by contraction, which might cause the hæmorrhage to cease. He used ice-cold water to empty the stomach. The danger of recurrence depended upon the digestion of the clot by gastric juice, the secretion of which was called forth by blood as by any other food. For this purpose alkalies must be given, which did not, like sodium bicarbonate, stimulate the secretion of more juice after neutralising an equivalent amount of acid, or give off large quantities of carbon dioxide, which distended the stomach and stimulated peristalsis. Oxide of magnesia was almost ideal from that point of view; it was most conveniently given as emulsio magnesiæ (B.P.C.). At the earliest possible moment after a hæmorrhage the patient's blood should be grouped and a donor found and kept at hand. Hæmoglobin estimation should always be done. He believed that the only indication for operation in the acute stage was severe and persistent hæmorrhage in an elderly person, with a long history pointing to the presence of a chronic ulcer, whose arteries were too degenerated for satisfactory plugging by thrombosis. Neither the occurrence of hæmorrhage in the past, nor the danger of future hæmorrhage in a patient who had not previously bled, should be regarded as indicating surgical rather than medical treatment for a chronic ulcer. The only definite indications for surgery were, in his opinion, perforation, hour-glass contraction, and pyloric obstruction, neither of which should ever occur, in his opinion, with early diagnosis, strenuous and prolonged treatment, and proper after-treatment.

Mr. R. P. ROWLANDS thought that most physicians and surgeons were agreed that operation was necessary for repeated bleeding of a chronic or duodenal ulcer. About 25 per cent. of these chronic ulcers caused obvious and severe bleeding; the latter was not the direct cause of death in more than 2 per cent., but by lowering the vitality it was an indirect cause. With an acute ulcer (particularly in a young person) there was every hope that thorough medical treatment would effect a cure, but recurrent hæmorrhages constituted a different class: when there was good evidence of a chronic gastric or duodenal ulcer, operation should be performed. Nowadays, expert radiography hardly ever failed to discover the crater of an ulcer, or a deformity due to it. The ulcer itself must be attacked; if the patient was very ill, the arteries should be tied and the ulcer invaginated with careful catgut sutures. A duodenal ulcer on the posterior wall should be cauterised, and gastro-duodenostomy should be done in preference to gastro-jejunostomy. It was a bad thing to operate during hæmorrhage, but hæmorrhage must not be said entirely to contra-indicate operation.

Resumed Discussion.

The discussion was then adjourned. On its resumption Dr. ROBERT HUTCHISON (President of the Section of Medicine) took the chair.

Dr. IZOD BENNETT noted that all the speakers had emphasised the fact that immediate treatment of all acute cases of gastric and duodenal hæmorrhage should be left in the hands of the physician. Cases were, however, continually sent into surgical wards of hospitals, showing that students and newly-qualified practitioners believed that a surgical treatment existed. Further to emphasise the fact that treatment was medical he enumerated four points: (1) The diagnosis was often very obscure; (2) the object of urgency was the prevention of the patient's immediate death, and of 61 cases he had examined post mortem 25 had died as a result of perforation, 13 from hæmorrhage, and 23 as a result of surgical intervention, so that operation caused more deaths than did hæmorrhage; (3) the patient after a severe hæmorrhage was not in a condition to stand the shock of operation; and (4) in the series referred to, hæmorrhage was responsible for 21 per cent. of all deaths due to gastric and duodenal ulcer. The mortality in cases medically treated was less than 5 per cent. Some kind of resection was the commonest form of surgical treatment to-day; not enough operators had given results of surgical treatment for any just comparison to be made, but unless such results showed a mortality below 5 per cent., resection operations were not justified. Absolute rest and prolonged starvation by the mouth were necessary in medical treatment; gastric lavage

he considered dangerous. Intravenous administrations of blood or saline were to be avoided, on account of the danger of raised blood pressure. When the probability of hæmatemesis was past, the problem changed, and the fact of hæmatemesis having once occurred might be an additional reason for surgical treatment.

Mr. G. GORDON-TAYLOR said that surgical treatment of acute ulceration of the stomach was never required, but chronic ulceration was a different matter. Some cases of elusive ulceration of stomach or duodenum seemed to be absolutely fatal diseases, because of the erosion of arteries. Treatment should be prophylactic, before the ulcer attained sufficient size to produce fatal consequences. Once a particular hæmorrhage had started it was wise to wait until it ceased, and then interfere as soon afterwards as possible, remembering that erosion of a large artery might occur very soon. He had operated when hæmorrhage was actually taking place, and had succeeded in several cases in a direct attack upon the ulcer as soon as hæmorrhage had stopped. The operator should be amply provided with all available methods of resuscitation, including facilities for repeated blood transfusion.

Dr. P. HAMILL described arrest of the hæmorrhage as the fundamental therapeutic principle. Gastric or duodenal hæmorrhage differed from hæmorrhage from the surface of the body in that one only knew that the patient had bled, and that the bleeding-point was not susceptible to pressure. He had never seen an immediately fatal case. Treatment, assuming a diagnosis of hæmorrhage from an ulcer, was of a patient who had bled, might be bleeding, or might bleed again. Complete tranquillity of the patient was necessary, and contraction of the musculature of the stomach could be aimed at. He believed that an ice-bag did help to arrest hæmorrhage; it undoubtedly eased the patient's mind by relieving soreness. The administration of chalk combined with magnesia was useful for the promotion of coagulation at the bleeding point. As regards the washing out of the stomach with cold water, he had had no occasion to use a method so drastic. The stomach-tube did not enhance tranquillity. Treatment was essentially medical, but cases occurred where surgical measures might be required; many of these were duodenal, and some were in elderly persons with sclerosed vessels, the ulcer perforating through into a vessel.

Mr. C. H. FAGGE could not agree with previous speakers concerning the danger of gastric and duodenal ulcers. He had seen W. J. Mayo excising duodenal ulcers, and since that time had himself excised every gastric or duodenal ulcer when there had been hæmorrhage. Some operation dealing directly with the ulcer was, in his opinion, the right thing. In the past few years he had seen two patients who died of hæmorrhage whilst surgical treatment was being considered. He had recently operated on a patient for a medical colleague who thought surgical treatment offered the only chance of saving the patient's life. He had opened the abdomen after blood transfusion, and had found a thickened pylorus, and a large ulcer on the lesser curvature, which he excised, discovering a large vessel in its base; he did not believe that medical means could have stopped that hæmorrhage. He had hoped to learn something regarding hæmoglobin estimation—what to do in cases where rest and other treatment failed to raise the hæmoglobin beyond 30 per cent., and whether it was then wise to interfere surgically.

Prof. G. E. GASK said that until three years ago he would have endorsed Mr. Paterson's opinion concerning the treatment of a patient bleeding from a gastric ulcer, but since that time his opinion had been changing. He had seen, post mortem, cases that had died of hæmorrhage with large open vessels in the ulcer. No medical treatment could stop hæmorrhage in such cases; ligature was necessary. Transfusion was very valuable. The technique of gastric surgery had improved, and he now believed that a certain number of these cases could be saved by surgery. The ideal thing was that gastric and duodenal ulcers should be prevented, but, as things were, they had to deal with a certain number of moribund cases of these conditions. He instanced a case where a hard, firm blood-clot distending the stomach, had to be removed by hand. He could not agree with Dr. Bennett that transfusion made patients more likely to bleed.

Mr. GARNETT WRIGHT said that all records of cases of hæmorrhage not due to ulcer should be removed from the discussion, for they falsified statistics. Diagnosis of these ulcers depended on the clinical history. Medical treatment was proper in the first instance, but in some cases hæmorrhage recurred repeatedly, and it became their duty to estimate which patients might be operated upon. He had operated in seven cases, with three deaths and four recoveries; he had never operated after a single hæmorrhage, and thought operation should, if possible, be deferred until bleeding stopped.

Dr. HUTCHISON, speaking from the chair, said that certain things had emerged from the discussion. One was that hæmatemesis was not considered to be very dangerous; he thought some speakers had tended to under-estimate that danger, having himself seen many fatal cases of hæmatemesis. Another point was the importance of accurate diagnosis. Surgery had been narrowed down to cases of hæmorrhage for chronic ulcer of stomach or duodenum. He believed that there was no medical treatment for hæmatemesis, beyond keeping the patient quiet. He had never dared to wash out the stomach and run in adrenalin, &c. Most of the earlier speakers had opposed surgical treatment of hæmorrhage from gastric and duodenal ulcers, and some of the later speakers had urged that some of these ulcers should be directly attacked. He believed that with modern facilities it should be possible to make a direct attack on the bleeding point.

Mr. PATERSON briefly replied.

JOINT MEETINGS OF THE SECTIONS OF THE STUDY OF DISEASE IN CHILDREN, NEUROLOGY, OBSTETRICS AND GYNÆCOLOGY, AND ORTHOPÆDICS.

BIRTH INJURIES.

A MEETING of these sections was held on March 6th, Dr. CUTHBERT LOCKYER presiding, when a discussion on Birth Injuries, with Special Reference to Intracranial Injuries with Hæmorrhage, and to Nerve Injuries, was held.

Mr. EARDLEY HOLLAND, who opened the discussion, drew attention to the astounding frequency of intracranial injury in cases of stillbirth and of neonatal death. This was a disturbing fact for obstetricians, since in so far as the injuries were mechanical in origin, they were largely preventable. The conditions were not always immediately, or even remotely, fatal, and there was reason to suspect that those children who survived might bear the stigma of birth trauma in the form of various nervous and physical maladies. The frequency with which hæmorrhage had been found varied, according to different observers, between 21 per cent. and 55 per cent. of cases of stillbirth and neonatal death examined, the last-named figure being that found by Mr. Holland. Hæmorrhage might be (1) subdural, (2) ventricular, (3) in the cerebral substance. Again, it might be severe, moderate, or slight, and was often diffuse rather than localised. Subdural was commoner than ventricular hæmorrhage. As to its ætiology, the hæmorrhage might be (*a*) traumatic, or (*b*) asphyxial. Traumatic hæmorrhage was usually accompanied by tears of the tentorium cerebelli or falx cerebri, and asphyxia by the signs of fœtal asphyxia, but this distinction did not always hold, because many cases with tears were accompanied by fœtal asphyxia. Possibly the initial traumatic hæmorrhage caused circulatory disturbances that led to severe asphyxia, and it was also likely that asphyxia was an important contributory cause of traumatic hæmorrhage, since engorged blood-vessels were more

likely to be ruptured by a superadded mechanical strain.

Traumatic Hæmorrhage.—To appreciate the mode of origin, it was necessary to know how the fœtal head behaved when acted on by the forces of labour. The fœtal head was a fragile object, which displayed a remarkable combination of qualities which enabled it to resist injuries, with defects which disposed it to suffer them. The wonder was the large number of fœtuses that reached the world alive and uninjured. Cranial stress consisted of two elements: (1) General compression of the whole head, and (2) simple longitudinal compression. The alteration of shape was brought about partly by the displacement of the plastic bony vault as a whole, and partly by the bending of the individual bones which compose it. Mr. Holland showed slides illustrating how the dura mater septa are attached to the cranial bones, forming a close arrangement of stays or ligaments. When the head alters its shape, alterations in tension of the septa are inevitable owing to the nature of the attachments to bones. Excursion and bending of bones is resisted by the tension of the septa, just as the swaying of a mast is resisted by the tension of its stays. If the alteration in shape is too great, the septa tear and this permits more extreme alteration in shape, and dangerous disturbances in other intracranial contents. These septa exert a protective function against excessive alterations. Support was lent to this theory by the special strengthening bands and fibres arranged on lines where stress is likely to fall. Tearing of the tentorium and falx was clear evidence of excessive cranial stress and formed the best and simplest means of estimating its degree. Tears lay in the area of greatest stress, usually at the free border of the tentorium near the junction with the falx, less commonly in the falx. All degrees of tear might be present. These bands acted as a restraining influence in keeping the fœtal head symmetrical, and when one was badly torn, the head sometimes became oblique. Tears were found by Holland in 48 per cent. of stillbirths, and by other observers in percentages varying from 24 to 60. Schaefer found them in 91 per cent. of stillbirths after difficult forceps delivery.

Mode of Origin and Source of Hæmorrhage.—The actual tear was not dangerous. Mr. Holland's view was that hæmorrhage mostly came from the vein of Galen or its tributaries, since any movement of the apex of the tentorium was necessarily transmitted to this vein, whose fixed point was at its entrance to the straight sinus, but this was, of course, not the only source of hæmorrhage. Circumstances which determined excessive cranial stress were (1) disproportion between the head and the fundus, or deficient flexion and great rigidity of separate parts, (2) forceps, if used too early with too great force, or if delivery were too rapid. Misplacement of forceps might cause damage, and the use of forceps to deliver a premature fœtus had its dangers. It was of great importance whether the stress was gradual or rapid—for example, tearing was found in 75 per cent. of dead fœtuses delivered by breech, and F. J. Browne stated that this injury was 15 times more likely to occur in breech than in vertex presentations. Similarly, rapid birth, spontaneous or following pituitary, was also dangerous. A soft and plastic premature head was more likely to suffer injury than the firm head of the full-term child. The fact that tearing of tentorium and hæmorrhage could occur after apparently a normal labour, was difficult to explain; possibly some of these cases were caused by a too zealous guarding of the perineum, especially by strong forward pressure forcing the occiput against the symphysis.

Fœtal Asphyxia and Intracranial Hæmorrhage of Asphyxial Origin.—When the circulation in the cord was obstructed or the placenta separated or degenerated, fœtal asphyxia resulted, and if it continued long the fœtus died. Post-mortem signs of asphyxia were found in 30 to 40 per cent. of fœtuses who had died during labour. Observers differed in regard to the relative frequency of traumatic and asphyxial hæmorrhage. In Mr. Holland's series of 92 cases he placed 75 as traumatic, 17 as asphyxial. Post-mortem differentiation was not always possible, and often the conditions coexisted.

The Pediatrician's Standpoint.

Dr. H. C. CAMERON discussed first the symptomatology of subdural hæmatoma in the newly born. In almost all cases there was a bulging fontanelle, and the cerebro-spinal fluid was under high tension and blood-stained. The ophthalmoscope in almost half the cases was said to show punctate hæmorrhages, more rarely œdema of the disc. An increased rigidity and spasticity of limbs, often with opisthotonos and trismus, was common, and either generalised convulsions or localised twitchings. There might be somnolence or coma, or persistent crying and restlessness with all the appearances of pain. Some interference with the respiratory rhythm was the rule. There might be asphyxia at the moment of birth, and respiration, when established, might remain shallow and halting. The suction reflex was often absent. It was clear that the life of such infants was precarious. Of Dr. Cameron's eight cases all were fatal, but he was convinced that in cases of lesser severity the condition was compatible with life. So long as our powers of diagnosis only enabled us to recognise the severest grade the doubt must exist. He advocated the routine use of lumbar puncture and of the ophthalmoscope in the newly born and a careful clinical examination, now often confined to noting the colour of the fæces. If recovery took place the long latent period before further symptoms developed might be accounted for by the fact that the pyramidal tracts only gradually become medullated during the first year; delay in the transition from the spastic uncontrolled movements characteristic of the newly born to that degree of voluntary control of lips, tongue, hands, and feet which the normal infant achieves might not be obvious to the parents until the failures to walk or grow at a year or more proclaimed it. The infant whose cortex had been damaged lagged far behind the normal in development upon the sensori-motor side, and infantile education proceeded largely along these paths; the initial delay in development was much greater than the ultimate loss. In later childhood improvement might be rapid. Dr. Cameron dwelt on the high plane of general character and power of concentration found in these children, and the improvement in mental condition following orthopædic treatment. They formed a group apart, which seemed to him clearly separated from cases of spastic idiocy due to a developmental deficiency of cortical neurones. That Little was right in contending that the cause was to be found in cortical hæmorrhage at birth, he believed strongly, although this condition might not be the only or invariable result of such an accident.

Dr. JAMES COLLIER said that he could conceive of recovery from hæmorrhage in nearly every one of the regions demonstrated by Mr. Holland, except from hæmorrhage in the brain substance. The origin of infantile spastic paraplegia from meningeal hæmorrhage was now discredited, though some few infantile spastic states might result from asphyxia. It remained to be considered why abnormalities at birth were associated with spastic diplegia. He had set out fully in his presidential address to the Neurological Section[1] his view that both these conditions were expressions of a deeper-lying pathological influence which had disturbed the mysterious relationship between mother and child. He then briefly reviewed the history of the supposed connexion of birth injuries with infantile spastic paralysis. He pointed out the common occurrence of varying degrees of subarachnoid hæmorrhage in the infant during the process of birth and argued that minor degrees of such hæmorrhage are unassociated with any detriment to the child, while major degrees had an especial symptomatology. He criticised the opinion that asphyxia neonatorum is dependent upon meningeal hæmorrhage.

[1] THE LANCET, 1923, ii., 1129.

Birth Palsy.

Mr. H. A. T. FAIRBANK said that in his series of 98 cases (males 56, females 42) 93 were unilateral and 5 bilateral, making a total of 103 arms paralysed. The evidence seemed to point strongly to the traction theory as being the correct explanation of the paralysis, if by traction were meant any position which involved deviation of the head away from one shoulder, which necessarily put strain at the upper cords of the brachial plexus, as well as direct traction of the arm, which was only exceptionally the cause. His reasons for favouring the traction theory had been set out in the *Journal of Orthopædic Surgery* (vol. ii., No. 5, May, 1920). Birth palsy was about four times as common in head as in breech presentations, the figures in his series being 71 vertex and 19 breech, two in which turning forceps were employed, while in six no details of the birth were obtainable. As a rule, but not invariably, labour had been difficult, and instruments had been used in half the cases. Of six plexuses explored, in five he had found evidence of more or less serious damage to the fifth and sixth cervical nerves. The paralysis was usually of the upper arm type, affecting the muscles supplied by these nerves. The vast majority of cases recovered more or less completely, certainly to an extent which contra-indicated operation on the plexus. The typical palsy was well known. Obvious signs of recovery were usually present three months after birth when the case had been properly treated. The treatment consisted in leaving the arm in a position which relaxed paralysed muscles, and daily massage and passive movements of all the joints to prevent contractures. The most important was the use of a splint (which was demonstrated) to hold the arm abducted at the shoulder and the forearm vertical and supinated. These cases showed a marked tendency to contractures, probably due to want of voluntary activity, in spite of the recovery of the paralysis. If there were no signs of recovery in three to six months, confirmed by electrical stimulus under an anæsthetic, the plexus should be explored. Nerve-grafting has been tried without real benefit; nothing but secondary suture of the nerves, or excision of scarred portions, followed by suture, was of any use.

Posterior Subluxation of the Shoulder-joint, by no means rare in children, was secondary to the paralysis, and was inevitable if the case was untreated. The subluxation did not develop unless a considerable degree of recovery had taken place. The deformity consisted in slight flexion and abduction of the humerus with marked internal rotation. External rotation was impossible, and this prevented the power of supination from being made use of; in fact, the hand was hardly used at all. The cases in which the displacement was reducible were treated by daily manipulations, and the use of the same splint as is used in the paralytic stage. In irreducible cases forcible attempts at reduction under an anæsthetic were unsatisfactory, and the method of choice was by open operation, the division of the junction of the subscapularis muscle, and the contracted anterior part of the joint capsule. Mr. Fairbank said that he now fixed the arm in abduction after operation, and in external rotation, and replaced the plaster cast after three or four weeks by a metal abduction splint which allowed of massage and active and passive movements. Although the other movements of the shoulder might show little improvement, outward rotation was always possible after operation, and this allowed the hand and forearm to be used. The tendency to adhesions and contractures of all joints, not only of the shoulder, still persisted in these children and had to be kept constantly in mind.

The Localisation of Hæmorrhages into the Brain Stem.

Dr. THOMAS LUMSDEN described the effects of hæmorrhage into the brain stem experimentally produced in mammals. It was reasonable to assume that hæmorrhage into the infantile brain stem must have similar results, and this had been confirmed by serial sections of two human brain stems into which hæmorrhages had occurred at or just after birth. The results observed corresponded accurately with the experimental findings. Before death these infants showed the type of breathing described as apneustic.[2] The effects of serious hæmorrhages at the levels of origin of the fifth, eighth, and tenth cranial nerves were found to correspond exactly with the results of section of the brain stem just below the level into which the hæmorrhages took place. The alteration in the position of the cephalic contents sometimes occurring during birth, which Mr. Holland had described, must involve a considerable alteration in the position of the brain stem, and here was a possible explanation of the occurrence of deep hæmorrhages. By noting certain alterations in the character of the breathing it was possible to predict ante mortem the exact level of the damaged area and to have some grounds upon which to base a prognosis, and Dr. Lumsden described the experimental evidence for the existence of four respiratory centres, which enable us to locate hæmorrhages into the brain stem. If after an intracranial hæmorrhage the normal type of breathing continues we may conclude that there is no serious injury to the brain stem. If the respiration is apneustic in type the hæmorrhage is in the pons. If only expiratory spasms and gasping occur the damage is at the level of the striæ, and if gasping alone is seen then the dominant hæmorrhage is just above the "noeud vital," near the apex of the calamus scriptorius. As to treatment, this must be immediate if it is to be of any use. In animals artificial respiration was most effectively achieved by pumping or blowing into the lungs oxygen to which 5 per cent. of CO_2 has been added, the latter in order to stimulate the respiratory centres. If the heart had stopped cardiac massage must be instantly performed.

As to prognosis, the lower down the brain stem the more serious were the effects of hæmorrhage, but recovery was possible whatever the level affected if the hæmorrhages were small and not very numerous. If in the cat the heart stopped so that the cerebral circulation ceased, unless it could be restarted within five minutes the cerebral hemispheres would not revive. If the circulation had ceased for 15 minutes the whole of the brain stem was irrevocably dead. So that while in the cat the heart might be restarted by massage and injections even after it has ceased beating for an hour or more, the central nervous system had been long dead, and could never resume its activity though the heart might continue to beat for several hours. It seemed probable that in man these viability periods (5 to 15 minutes) would be yet shorter than in the cat, so that most of the cases of attempted revival reported in the press were of necessity quite hopeless and unavailing.

Dr. GILBERT STRACHAN said that in 100 cases of stillbirth examined by him dural laceration was found in 23, and in 50 cases of neonatal death a similar lesion was present in 12; the total was thus 35 out of 150 cases of stillbirth or neonatal death, approximately 23 per cent. The laceration was accompanied by hæmorrhage of varying degree in 26 out of 35 cases in which tears had been found. In a number of cases in this series the bleeding did not appear to be sufficiently extensive for such an origin as Mr. Holland suggested (vein of Galen), since the hæmorrhage was represented by only a little clot. Dr. Strachan also found the liability to tentorial laceration, which was by far the commonest cause of intracranial hæmorrhage, was markedly increased in breech presentations, and emphasised the desirability of prophylactic external version in all breech cases, especially in primiparæ. In some of the neonatal cases who lived from one hour to

[2] An apneusis is a prolonged inspiratory tonus or holding of the breath. A gasp is a sudden involuntary incoördinated inspiration. Dr. Lumsden's researches are published in full in the Journal of Physiology, lvii., 153 and 353; lviii., 81 and 111.

four days the infant presented no abnormality at birth, and death in these cases usually occurred suddenly. Generalised twitchings and convulsions were seen in a number of cases, in others inability to suckle, while a drowsiness deepening to coma was present. In the majority of cases under discussion obstetrical difficulty was present in varying degree.

Dr. BERNARD MYERS described briefly the case recorded by himself and Dr. W. D. Kirkwood in THE LANCET of July 14th, 1923, which supported the experimental evidence given by Dr. Lumsden. He pointed out that since this condition was not well recognised medico-legal trouble might arise, and it should be borne in mind when the case against the parents or nurse looked suspicious.

Mr. D. M. AITKEN gave instances of the immense benefit to children with spastic paraplegia, not only in their physical but in their mental condition, which followed re-educative treatment by orthopædic surgeons.

Mr. BRIGHT BANISTER said that from the obstetrical standpoint three considerations arose: (1) the causation of injuries; (2) the fatalities attending them; (3) the possibility of their prevention. As to causation, he agreed with Mr. Holland that no such hurry as had been at one time taught was essential in the delivery of living babies in the breech presentation. It was unnecessary and dangerous to attempt to deliver the head in under five minutes from the time of the birth of the umbilicus. In one case in his experience 14 minutes' interval had elapsed and the infant breathed normally after a few minutes. As to causation of birth palsy, traction exerted on the head after birth in order to deliver the anterior shoulder was a point not to be forgotten. Too much force used here might well cause injury. As to prevention, the obstetrician could only continue his irksome duty of urging practitioners to forestall difficulties instead of waiting to overcome them.

SECTION OF LARYNGOLOGY.

SUPPURATIVE DISEASES OF THE SINUSES.

A MEETING of this section was held on March 7th, under the presidency of Mr. H. J. BANKS-DAVIS. Instead of the usual clinical meeting, a discussion was held on the subject of Suppurative Diseases of the Frontal, Ethmoidal, and Sphenoidal Sinuses.

Mr. MUSGRAVE WOODMAN introduced the subject. He said suppuration of the sinuses enumerated in the title constituted border-line territory. Above it the physician held sway, and often confirmed his diagnosis on the post-mortem table. From below the rhinologist looked up along the dark passages and around corners. Between the two lay a territory as yet very imperfectly explored. Such could only take place by collaboration and accurate histological examination on the part of those who dealt with either side. Comparison of the frontal sinus with the gall-bladder was an apt one; it was a cavity drained at its lowest part by a tube leading to a larger cavity, and its illnesses largely depended on the conditions in the duct and the morbid processes which surrounded that duct. Dr. Logan Turner was insistent that before any operation on the frontal sinus was contemplated a complete X ray examination should be undertaken to disclose its pathological anatomy. Frontal abscess, of which he was exhibiting a specimen, was a somewhat rare complication. An important complication was osteomyelitis, which was well known as a sequel of any operation in the region of the frontal sinus; it did not arise after operations on the antrum, and but rarely in connexion with procedures on the ethmoid. The mucous membrane lining was continuous with that of the nose, the bony walls were continuous with the nasal sinuses, and the abnormality was in the blood supply. There were no veins in the frontal sinus itself. The free anastomosis existing between the angular veins, the superior longitudinal sinus, and the emissary veins of the meninges, suggested it was the vascular connexion which had much to do with the occurrence of osteomyelitis in the frontal sinus. With regard to neuralgia of the frontal sinus, many of these cases did not come to the rhinologist. One case he quoted was that of a man who was well until five years ago, when he began to have nasal catarrh. Every winter thereafter he had a sense of oppression and discomfort over the right side of his forehead. Last winter it culminated in a violent attack, and he sought advice. Mr. Woodman at the operation found pus in the frontal sinus under considerable tension.

Concerning the methods of treatment of frontal sinus conditions, those who knew the intranasal approach to the sinus were aware of the cases in which that was suitable and what were its limitations; they also knew its complications. But it was very desirable to know, without bias, what type of case was most suitable for the external operation. The best type of external operation had now been placed beyond question; it was that devised by Mr. Walter Howarth, a member of the section. Mr. Woodman regarded it as a perfect operation. Was an external operation necessary in all cases? What were its complications? Did osteomyelitis arise from it? It was less likely to arise as, by this operation, the bone was approached through the floor. It was desirable also to know what were the results of the operation and the difficulties of drainage which had been encountered. With regard to the ethmoid bone, it was a spongy bone, and a source of permanent and late infection. Infection spreading up the nose receded again and left infecting organisms in the loculi. The ethmoid was divided obliquely into an antero-inferior portion and a postero-superior portion, which were distinct, influencing respectively the frontal sinus in front and the sphenoidal fissure behind. The normal ethmoid bone had a large number of perforations, due to the passage through it of vessels. The difference between the dura mater and the floor of the anterior fossa of the frontal sinus was very considerable. Frontal suppuration would cause extra-dural abscess, or frontal lobe abscess, but it did not often cause generalised meningitis. He had seen two cases of encephalitis lethargica in which every sinus in the head was full of pus, and the patient seemed to be dying. The physician and neurologist were met in consultation, but no post-mortem examination was allowed. A series of investigations were much wanted on these meningitis cases which died following sinus involvement; many of them had had persistent sinus trouble which had been unsuspected.

Mr. Woodman said he was convinced that cavernous sinus thrombosis arose primarily from the ethmoid, not from the sphenoid. It would seem to be the right treatment to start a complete exenteration of the ethmosphenoid on one side, and so approach the cavernous sinus and turn out the clots. In the ethmoid a subtle form of neuralgia was met with, and its origin was apt to be missed. He related a case of it. It was desirable to know whether it was necessary to remove all the ethmoid cells, or whether the opening up of a certain number was sufficient. In the former event he discussed the best procedures. The sphenoid was a plain cavity; he showed a slide of it, indicating the close proximity of the palatine ganglion, the vidian nerve, and the middle turbinate bone to each other. The slide showed how disease in the posterior cells could exert its bad influence. The sphenoid he considered was more often maligned than it deserved to be; the source of trouble was more often the ethmoid. The importance of the sphenoid lay in its relationship to the optic foramen and the vidian canal. Sluder's experiments showed that the first and second divisions of the fifth nerve could be reached by cocaine, and therefore by sepsis and by drugs. He exhibited slides to illustrate the danger of operating on the ear for sphenoidal disease when sphenoid pain was referred behind the ear. Suppuration in the sphenoidal cavity might cause dilatation of the pupil and visual symptoms. In conclusion, Mr. Woodman referred to the connexion of the sinuses with the pituitary. It was now well known that a source of sepsis anywhere in the body had a marked influence on the

thyroid gland; therefore, in view of the permeability of the sphenoidal sinus by drugs, he asked whether it was not probable that in latent or active infection of that sinus the pituitary itself would be infected. He thought there was a wide field for research in connexion with the pituitary gland; and that meningitis and neuralgia also stood in need of a good deal of investigation.

Dr. W. T. GARDINER gave a clear description, with the aid of lantern slides, of the method carried out by Sluder in opening the ethmoid and sphenoid intranasally. It was carried out under local anæsthesia.

Dr. DOUGLAS GUTHRIE described his efforts to ascertain the degree of friability of the cribriform plate, and its relationship to the anterior ethmoidal cells; also how easily the cribriform plate could be broken into. He found that the anterior part was the more easily penetrated. It constituted an argument for the Sluder operation. In 74 per cent. of 200 skulls he found the ethmoidal cells rose above the cribriform plate, and that the olfactory groove was deep; shallow in the remaining 26 per cent.

Mr. HERBERT TILLEY referred to cases of osteomyelitis of the frontal bone, apart from operations on the sinus. In opening the sinus externally he urged that no sharp curetting instrument should be used, because of the danger of opening some of the small diploe and allowing some infection to enter. Sphenoidal sinus diseases he considered to be very common. He discussed the whole subject at some length.

Mr. ERIC WATSON-WILLIAMS showed skiagrams of some cases of frontal sinus disease, and related their symptoms and treatment.

Dr. LOGAN TURNER (Edinburgh) said that last spring he sent a questionnaire on the subject of intracranial complications to the surgeons in this country, especially with reference to osteomyelitis. These complications were divided into two groups: (1) Spontaneous, (2) post-operative. There were 125 returns, of which 77 were spontaneous, 48 post-operative, the former occurring in patients under 30 years of age, in two the patients were under 10; 34 were complications of acute and subacute sinus suppuration, 40 complicated chronic sinus suppuration. It would be valuable if there could be returns of the percentage of complications which arose in sinus suppuration, so that they could be compared with the intracranial complications arising in aural suppuration. Complications occurred where one sinus alone was affected in 37 per cent. of the cases; where two or more sinuses were involved the percentage was 62. Of 71 cases the frontal sinus was involved in 41, the sphenoidal in 19, the ethmoidal in nine, the maxillary in two. The post-operative complications occurred mainly after operations for chronic sinus suppuration—namely, 89 per cent.; only in 10 per cent. of acute sinusitis. Osteomyelitis occurred in 58 per cent., and it was not by any means only a sequel of the external operation. He agreed it might be started after operations on the antrum. Osteomyelitis followed frontal sinus operation in three of eight intranasal operations, and in 12 of 20 frontal bone operations.

Sir STCLAIR THOMSON said that in his clinic there had been a considerable number of what he regarded as spontaneous cases of osteomyelitis, many of whom gave a history of having recently been in a swimming bath. These spontaneous cases responded favourably to operation, and in that particular were in favourable contrast to the others.

Mr. W. S. SYME expressed his satisfaction with the Sluder operation, and related his operative methods. He uttered a warning against perforating the sphenoidal sinus from the centre of the anterior wall; one should have great respect for the dura mater covering the floor of the cranial cavity. In dealing with the ethmoidal cell, the great need was thoroughness.

The PRESIDENT thought sinus cases were often operated upon in hospital too soon.

Mr. G. W. DAWSON agreed with the President.

Mr. WOODMAN, in reply, said he did not think that 50 years hence the Killian operation would be required or performed at all; he considered Mr. Howarth's operation far superior. With regard to the danger of meningitis in connexion with ethmoidal disease, he agreed it was a danger, but in one or two cases of malignant disease he had exposed the dura of the anterior fossa freely, and in one case he accidentally cut it, and cerebro-spinal fluid came out; but he stitched it up, applied iodine, and saw that it was well drained, and the patient did not even have a rise of temperature. The condition he had to deal with in that case was not only malignant, but also septic; he did not think malignant disease occurred in the upper part of the nose without sepsis. But the greatest care must be taken not to perforate the cribriform plate or any part of the floor of the cranial cavity.

A number of patients and specimens were shown by various members.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF SURGERY.

Surgical Treatment of the Stomach.

A MEETING of this section was held in the Royal College of Physicians on Feb. 29th, Sir WILLIAM I. DE COURCY WHEELER, the President, being in the chair.

Mr. JAMES SHERREN delivered an address on Observations of Disease of the Stomach and Its Surgical Treatment, which was published in THE LANCET of March 8th.

The PRESIDENT said that the first question to be settled was the question of diagnosis of gastric ulcer. Surgeons often hesitated for sound reasons to make the diagnosis unless supported by a positive X ray picture. He alluded to the manner in which extra gastric lesions mimicked ulcer of the stomach, and pointed out that although hæmatemesis might be a brick in the diagnostic building, it arose from so many causes other than ulcer that it was by no means conclusive. He agreed that the association of chronic ulcer of the stomach with malignant disease was very definite and close, but thought it must be difficult to arrive at a figure representing the percentage of chronic gastric ulcers which became malignant. The President strongly agreed with the teaching of Mr. Sherren, Sir Berkeley Moynihan, and others in connexion with the necessity for partial gastrectomy in the treatment of many forms of chronic ulcer, and supported the view that the convalescence was uneventful and the mortality inconsiderable. A chronic ulcer left in situ, in healing, produced stricture of the pylorus, "hour-glass" stomach, stenosis of the cardiac end, or became malignant in perhaps 40 per cent. of cases—the figure given by Mr. Sherren. He recommended cauterisation by the Balfour method in small, easily accessible ulcers, with the addition of gastro-enterostomy, and a sleeve resection in cases where there was a fair amount of healthy stomach both proximal and distal to the ulcer. A union between the two segments gave good functional results. An indurated chronic ulcer at the pyloric end was treated by closure of the duodenum, partial gastrectomy, and anastomosis in front of the colon between the jejunum and the proximate segment. In one case, in order to get above a chronic ulcer in a woman aged 60, he was obliged to remove the entire stomach. He showed seven specimens of chronic ulcer and malignant disease of the stomach removed recently by partial gastrectomy. He had operated upon one case of gastro-colic jejunal fistula. Small ulcers with a free mobile stomach could be safely treated by gastro-enterostomy.

Mr. A. B. MITCHELL said that Mr. Sherren's wise paper almost disarmed criticism. One thing he had said

with which the speaker could not agree, was that the operation of gastro-jejunostomy was a cure for gastric ulcer. Mr. Mitchell was of opinion that in many cases of simple non-malignant ulcer gastro-jejunostomy would not effect a cure. The operation for gastric ulcer was a serious one. He would never put the operative risk in disease of stomach under 3 per cent. Even the simplest operation was sometimes borne badly by the patient. The idea of a perfect stomach was, he thought, one that was freely movable, and this was a condition which had got to be secured at operation. It was remarkable how little stomach a person required to live and to be healthy. The question of heredity was an interesting one. Mr. Mitchell quoted cases of family incidence. He believed that the ideal place for gastro-jejunostomy was the pre-pyloric pouch, as he thought the higher up it was done the less likely the patient was to have comfort afterwards. Sometimes a patient would remain well for perhaps ten years after operation and then would come back complaining of stomach symptoms. In these cases he always suspected peptic ulcers, and though after medical treatment the patients got practically well, they never had much comfort and generally came back for another operation. The so-called silent gastric ulcer occurred in patients who came into hospital with acute perforation, the result of a hard ulcer which must have been present for at least three years, and yet the patients said they had never had any symptoms whatsoever, neither indigestion, nor pain, nor anything else.

Mr. SETON PRINGLE confined his remarks to the discussion of the various operative measures for hour-glass stomach. He referred briefly to the diagnosis of the condition, laying stress on the importance of X ray examination. He exhibited slides illustrating the different methods he had employed in this condition, with, in many cases, X rays of post-operative results. In conclusion, he stated his belief that partial gastrectomy, where possible, was the most satisfactory operation, but that where this was not feasible a posterior gastro-enterostomy into the upper sac was the best procedure. Where the distal sac was large, or obstruction of the pylorus or duodenum also existed, he advised that a second stoma be provided from the distal sac into the same or another loop of jejunum. In cases of difficulty he had no hesitation in performing an anterior gastro-enterostomy, with or without an entero-anastomosis. He classed as unsatisfactory all direct attacks on the constriction. He regarded as essential the excision of an active ulcer should such be found at the operation.

Mr. R. C. B. MAUNSELL was absolutely in accord with most of what Mr. Sherren had said, and he was glad to hear him re-state that gastro-enterostomy would cure most gastric ulcers and all duodenal ulcers. This was a fact which was known and believed some years ago, but which lately had become unfashionable. He personally only performed gastrectomy in cases of malignant disease, and he thought that ten years hence this operation would not be known at all. Gastrectomy performed in cases of ulcers might justly be called over-operating.

TUBERCULOSIS SOCIETY.—An ordinary meeting of this society will be held to-day (Friday), at 8 P.M., at the Margaret-street Hospital, Margaret-street, W., when Dr. Alex Sandison and Dr. Basil Price will read papers on the Tuberculosis Work of the Ministry of Pensions, Administrative and Clinical.

The annual provincial meeting will be held at Cambridge on April 10th, 11th, and 12th, when the following lectures will be delivered:—April 10th: Dr. Louis Cobbett, A Comparison of Tuberculosis in Man and Animals; and Dr. E. Ward, Experiences with Diaplyte Vaccines. 11th: Dr. R. C. Matson, of the National Tuberculosis Association of America, will speak on Tuberculosis Work in America, Dr. Stanley Griffith on Lupus, and Mr. G. R. Girdlestone on the Present Day Treatment of Bone and Joint Tuberculosis. On the 12th a visit will be paid to the Papworth Colony by invitation of Dr. P. C. Varrier-Jones, the medical director. Particulars regarding travelling arrangements and accommodation may be had from Dr. F. J. C. Blackmore, hon. secretary, 38, Herbert-road, Plumstead, S.E. 18.

Reviews and Notices of Books.

PSYCHIATRY.

Occupation versus Restraint. By L. VERNON BRIGGS, M.D. Boston, Mass.: Wright and Potter. 1923. With 10 illustrations. Pp. 205.

THIS book is a record of its author's efforts to improve the conditions of asylum treatment in Massachusetts. It has to be remembered that the lunacy laws of the States composing the U.S.A. exhibit wide variations, and the reforms in which Dr. Briggs was the leading protagonist were already accomplished and accepted as a matter of fact in the State of New York before his work began. Apparently the laws of Massachusetts admitted of various abuses; in State asylums the attendants were generally of an unsuitable type, and not infrequently brutal in their treatment of patients; mechanical restraint was commonly practised and insufficiently recorded, and occupation therapy was neglected. Numerous private asylums existed, innocent of any adequate State control, and conducted principally for financial gain; in these various abuses were alleged. Owing almost entirely to the energies of the author, two Bills were passed in the year 1911 by the Senate of Massachusetts, the main effects of which were severely to limit the uses of restraint, to institute the proper selection and instruction of attendants, and to introduce occupational treatment. This record of the years spent in attaining these ends reads almost like a personal diary; much correspondence, some of which appears trivial, is quoted verbatim, and a good deal of space is devoted to an aspect of the work which must remain a source of regret to everyone concerned—namely, the personal antagonisms among interested members of the medical profession in Boston which were occasioned by it. The history of this legislation, typical as it is of the advances which mental treatment has made, and is making, throughout the civilised world, is of the first interest, and Dr. Briggs's exposition of it leaves nothing to be desired in clarity, detail, and enthusiasm, but it seems unfortunate that after the lapse of over ten years the differences with his colleagues which these efforts entailed should still receive public advertisement and emphasis.

Record of events subsequent to 1911 is, unfortunately, scanty; more space may perhaps be devoted in a future edition to the effects of the changes made in that year and to the position at the present day. It is always difficult to visualise the conditions of treatment of the insane in the United States, since geographical variations both in the law and in its application still appear to be considerable.

Addresses to Mental Nurses. A Series of 15 Lectures delivered to the Nursing Staff of The Retreat, York, by Various Authorities. Edited and arranged by BEDFORD PIERCE, M.D., F.R.C.P. London: Baillière, Tindall and Cox. 1924. Pp. 288. 7*s.* 6*d.*

DURING the past 22 years it has been customary at the York Retreat each year to invite a distinguished alienist to deliver an address to the nursing staff. Dr. Bedford Pierce, until recently medical superintendent of The Retreat, has published 15 of these addresses in book form, each being preceded by a short account of its author, a feature which adds greatly to the interest of the volume. Although broadly concerned with the practice of nursing, the subjects chosen vary considerably; several are really lay sermons on the higher duties of nurses to the insane, and on the motives and character which must underlie their work. In some cases the subjects are more technical—for example, the late Dr. James Middlemass on night nursing, and Dr. Henry Devine on occupation therapy. A few deal with what may be called the philosophy of mental alienation, and not a few vital questions of ethics receive considerat on. One of these is summed up in a quotation from the late Dr.

Charles Mercier: "I can conceive of circumstances in which it might be right to deceive a sane person, but I can think of none which justify the deception of an insane person." Perhaps the wittiest in a company not by any means devoid of humour is the late Sir George Savage, in an address on the Private Nursing of Mental Patients; many of his anecdotes are worthy of an accessible pigeon-hole in the reader's memory.

The publication of these addresses may be welcomed not merely on the score of their scientific and literary merit, but because the book fulfils two purposes which are served by no other. As a medium for conveying some idea of asylum work, its difficulties, and the spirit in which they are faced, it is capable of improving public understanding of this work, a function of which no other book in existence is capable; if it should have the effect of inducing educated women to enter the mental nursing service it will have served another valuable purpose. For mental nurses themselves it provides a stimulus and an interest which are perforce lacking in their text-books, and it is very much to be hoped that mental hospitals throughout the country will see that copies are available for such of their staff as are unable to buy it. Just as the education of a medical student may be considered incomplete until he has read such classics as "Confessio Medici," and Lauder Brunton's lectures on the Action of Medicines, so should this book in future years be regarded as essential to the higher education of the mental nurse.

RADIOGRAPHY AND RADIOTHERAPEUTICS.

Vol. I., Radiography. Fourth edition. By ROBERT KNOX, M.D., C.M. Edin., Hon. Radiographer, King's College Hospital, London. London: A. and C. Black. 1923. Pp. 448. 40*s*.

Dr. Knox's work has come to be recognised as one of the best books on radiology published in this country, and has established the author's reputation abroad. This first volume of the fourth edition is occupied entirely with radio-diagnosis, and in the first part dealing with electrical supplies, apparatus, and the equipment of X ray departments there is little notable change from earlier editions. The publisher's note tells us that advantage has been taken of the opportunity to revise carefully the text and to add the results of considerable advance in the technique for the examination of the liver, gall-bladder, and urinary tract; but in view of the more elaborate volumes dealing with the chest and the gastro-intestinal tract which the author has in preparation, it was decided to leave these last-named sections practically unchanged.

This paragraph shows at once the strength and weakness of this edition. The strength is manifested in the excellent sections on X ray examinations for diseases of the gall-bladder and kidney which give all that is good and latest in the investigation of these conditions and pyelography. The anatomical considerations are clear and well put, and particular attention must be drawn to the very practical and illuminating Appendix I.—viz., "Observations on Cases Illustrating the Differential Diagnosis in Renal and Gall-bladder Work." It seems unfortunate, however, that for whatever reason the sections on the thorax and gastro-intestinal tract should not have been brought so fully up to date. Cardiospasm, a phenomenon of increasing interest, still receives scant notice, while, although Carelli's method of perirenal inflation is dealt with at some length, the reader looks in vain for material on which to form an opinion regarding the value of artificial pneumoperitoneum as an aid to X ray diagnosis. In the section on thorax no great stress is laid on the use of stereoscopy in the examination of chest conditions, especially in the question of the diagnosis of early tuberculosis, where it may be of the greatest value. Nor are there any references to the examination of chests after the production of artificial pneumothorax, a proceeding of very definite diagnostic value, bringing the radiologist into touch with the general physician.

The chapters on injuries to bones and joints have been rearranged and enriched by many additional illustrations. In fact, in spite of the loss of definition which is inevitable in the reproduction of X ray negatives, the prints are clear and form a notable feature of every part of the book. Besides the appendix mentioned above, there are notices of the Protection of X-ray and Radium Workers, and a brief description of the working of a Lilienfeld tube, while the Potter-Bucky diaphragm is still kept in the appendix section and no references are made to attempted modifications. The subject of radiography in midwifery is not discussed, and is perhaps the biggest complete omission. But the author has had to use much judgment in what things deliberately to leave out. At the present time there is no better work than Dr. Knox's on its subjects.

OPHTHALMOLOGY.

Lehrbuch der Augenheilkunde. By Dr. PAUL RÖMER, Director of the University Eye Clinic at Bonn. Fourth revised edition. With 306 illustrations in the text and 32 coloured plates. Berlin and Vienna: Urban and Schwarzenberg. 1923. Pp. 500. 15 Standard Marks.

THE third edition of this text-book was reviewed in these columns some four years ago and the revision to which the present edition has been subjected has not materially altered it. The illustrations, and especially the coloured ones, are remarkably good, a fact which makes the work valuable to the non-German student. The style is concise and there is no superfluous matter. Indeed, in a work on this scale the student could wish for a fuller treatment of some important subjects such as glaucoma. The book does not profess to be a guide to ophthalmic operations.

THE INSULIN TREATMENT OF DIABETES MELLITUS.

By P. J. CAMMIDGE, M.D. Lond., D.P.H. Camb. Edinburgh: E. and S. Livingstone. 1924. Pp. 172. 6*s*.

THE book opens with an account of the previous attempts which have been made to find the internal secretion of the pancreas, and goes on to give a short description of the circumstances which led Banting to discover insulin. An account is then given of the early clinical results obtained by the Toronto workers. The exact meaning of the term diabetes mellitus and the different conditions which are included under this name are considered, and Dr. Cammidge sets out briefly the different types which he has distinguished. [This work has been dealt with at length in the author's book entitled "New Views on Diabetes Mellitus," which was recently reviewed in these columns.] The indications for the use of insulin are then described, and an account is given of Kellog's table for drawing up a diet for a patient. The ideals of treatment, no sugar in the urine and a normal blood-sugar, are then discussed.

The actual method which the author uses is a most formidable one, as it entails the carrying out of a very large number of investigations in order to place the type of the disease, and this can only be done in the laboratory. The patient is given a standard diet which contains a large amount of carbohydrate, often 80 g., so as to determine the severity of the disease. A test breakfast is given, and the blood-sugar investigated at short intervals after it. On these findings it is decided whether the type is suitable for treatment with insulin. So far about 50 per cent. of the patients examined have not been deemed suitable, as the glycosuria could be controlled by dietetic restrictions. Details of these cases are given, and also of many others in which insulin was used with much benefit to the patient. The amounts of carbohydrate which Dr. Cammidge aims at giving are much larger than

are used by other workers, 95 g. in one case being used with 40 units of insulin. Renal glycosuria and its dangers with regard to insulin are touched on, and an account is given of the symptoms of hypoglycæmia. One patient, who was eating 90 g. of carbohydrate, having had 40 units of insulin, was taken ill because he omitted to eat the usual amount of carbohydrate after his morning dose of insulin. He quickly recovered from the state of hypoglycæmia when sugar was given. The treatment of coma is discussed and also the ill-effects of infections. The point is made several times that insulin is not a cure, and that the statements in the lay press have had an unfortunate effect on many patients who think that they can have insulin and eat what they like.

The book is not very easy to read, and the account of the treatment with insulin is somewhat overloaded with details of the diagnosis of the condition, but it contains much interesting matter, is well printed, has a good index, and is moderate in price. It conveys valuable and practical lessons.

THE CHEMICAL BASIS OF GROWTH AND SENESCENCE. By T. BRAILSFORD ROBERTSON, Ph.D., D.Sc., Professor of Physiology and Bio-chemistry, University of Adelaide, South Australia. London: J. B. Lippincott Co. 1923. Pp. 389. 12*s.* 6*d.*

THE appearance of a monograph on the chemical basis of growth will be welcomed by all students of experimental biology whose lot it is to study that "transient force which, by an impulse, seizes flesh and grows to man."

In an introductory chapter the author stresses the similarity between the growth curves of animals and plants, and the curves of autocatalysed monomolecular reactions. It is realised, however, that the process of protoplasmic synthesis is actually an exceedingly complex one, involving multitudinous parallel, successive and independent reactions. To show that a simple formula, such as that which characterises the progress of a monomolecular autocatalysed reaction can be applied to a complexity of events, it is necessary to invoke the idea of a "master reaction." The slowest reaction in a series of chemical reactions is looked upon as governing the time relations of the whole, much in the same way as in a factory the slowest of the diverse operations determines the daily output of the finished product. In the higher metazoa, at any rate, it is suggested that the forward reaction, governing protoplasmic synthesis, is actually polymolecular, though the reverse reaction of protoplasmic breakdown is probably monomolecular. In succeeding chapters the growth curves of man, animals, plants, and unicellular organisms are considered in relation to the foregoing theory. "Allelocatalysis" is dealt with at some length, more especially in relation to the development of Enchelys. It is of interest to note that more recent work has failed to confirm the necessity for the animal to develop a definite concentration of "X substance" before division can take place. Although growth-promoting substances undoubtedly exist it is doubtful whether their action is as simple as the author suggests.

The substrates of growth—that is to say, the raw materials of protoplasmic synthesis, inorganic salts, amino-acids, and accessory food factors—are next considered; after which senescence and the retarding influences of growth receive attention. The conclusion is reached that senescence is the necessary outcome of differentiation. This is followed by a brief but highly speculative consideration of cancer, and an equally speculative chapter dealing with the relation of lecithin, cholesterol, and "tethelin" to growth.

As an example of the author's conception of growth, the law which regulates the growth of the cells of a higher animal under ordinary conditions, may be given in his own words. "The accumulated autocatalyst of nuclear synthesis, stored up in the nuclei and prevented from escaping at the moment of nuclear division by the abundance already present in the nutrient medium, finally accelerates the reverse reaction of nuclear synthesis to so great an extent that the velocity of the reverse reaction becomes equal to that of the forward reaction, before the critical nuclear ratio which is requisite for cell division is attained. Further cell multiplication is thus inhibited and stasis is imposed."

The origin of cancer, as the result of repeated repair of injured tissue, is interpreted as "a process of selective breeding whereby the cells of the lowest nuclear ratios" (Hertwig's Kern-Plasma relation) "are favoured and enabled to propagate. Should the inherited variability of the cells in the locality enable at length the appearance of a type of cell so physiologically differentiated from its competitors as to be able to multiply freely at the prevailing nutrient level and in the presence of the prevailing accumulations of autocatalyst, then an outburst of reproductive activity must inevitably ensue and the successful type of cell will inaugurate, if it is sufficiently differentiated, a malignant tumour." This sounds more impressive than illuminating. A bibliography of some of the more important literature on the subject of growth is appended.

The treatment of the subject varies from applied mathematics to reckless speculation, but the book on the whole is of considerable interest as an individual attempt to interpret the various aspects of the growth problem.

TOXICOLOGIE.

Fourth edition. By FONZES-DIACON, Docteur ès Sciences, Agrégé de Chimie et de Toxicologie, Professeur de Chimie Minérale à la Faculté de Pharmacie de Montpellier, &c. Paris: A. Maloine et Fils. 1924. Pp. 452.

THIS work, now in its fourth edition, is a useful practical handbook on toxicology. Of moderate dimensions, it does not pretend to deal with the subject exhaustively, but there are few substances likely to produce poisonous symptoms which do not receive attention. The writer has evidently had wide experience in the isolation and detection of poisons, and has described admirably the analytical details necessary. His methods are sound and the processes readily followed. The descriptions of the symptomatology, post-mortem findings, and the treatment are the least satisfactory parts of the book. There is a great difference between an account of the symptoms and a graphic picture of a patient suffering from a particular poison, and the descriptions here given are, unfortunately, of the former type. The treatment is mainly limited to the enumeration of correct chemical antidotes, little attention being paid to the all-important, general treatment of the patient. The index is poor, the page number of the principal reference only being given.

JOURNALS.

JOURNAL OF ANATOMY. Vol. LVIII. Part DD. January, 1924. Cambridge University Press. Pp. 91. 10*s.*—A number mainly composed of short papers. Dr. H. H. Woollard gives an account of his results in vital staining of the leptomeninges, his experiments being planned to avoid that toxicity which certainly complicated the results of some of Goldmann's experiments.—Prof. J. T. Wilson describes how he applies the Spalteholz clearing method to the study of thick serial sections of embryos. Those who had the opportunity of seeing the striking specimens shown at Cambridge last summer by him will be glad to have an account of their preparation. Prof. Wilson is not yet satisfied with the permanency of his staining.—Mrs. Katharine M. Watson has an interesting and important paper on the development of heart and blood-vessels of the cat.—Prof. F. H. Edgeworth gives a useful account of the masticatory, intermandibular, and hyoid muscles of *Orycteropus capensis*.—An excessively rare variety of abnormal atlas is described by Dr. R. H. Hunter. In this the

original body (odontoid process) remains attached to the atlas.—Prof. Gordon Harrower gives some short remarks on embalming in the tropics.—An account of rudimentary otocephaly in a human fœtus is given by Prof. J. A. Pires de Lima. This variety of monstrosity is not very rare among lambs and kids.—Prof. N. Kulchitsky follows with an important paper embodying his observations on nerve-endings in muscles; he has worked particularly on the muscles of Python, in which he shows the existence of two types of motor-nerve terminations, and deals with many details of structure.—Dr. R. J. Gladstone has a suggestive note on the post-natal growth of the kidney, thyroid gland, and liver, considering these from the point of view of enlargement of the unit structure (hypertrophy) or increase in number of such structures (hyperplasia).—The last contribution is a short account, by Mr. W. W. Wagstaffe, of a rare duodenal anomaly.

British Journal of Anæsthesia. January, 1924.—The January number of this quarterly starts with an attractive little historical article on John Snow by Dudley Buxton.—J. T. Gwathmey follows with an account of laboratory and clinical experiments with ethylene and other hydrocarbon gases. From this it appears that ethylene has its uses as an anæsthetic, but not as one which is to be relied on unaided to produce satisfactory anæsthesia. Its analgesic more than its anæsthetic properties appear to have impressed themselves on the investigator. Another article deals with endo-tracheal administration of gas and oxygen with ethanesal and chloroform, a method warmly extolled by Langton Hewer, who gives details of technique and records admirable results. Warm ether vapour, pulmonary after-effects, reciprocity between surgeon and anæsthetist, and other problems form the subject matter of further contributions. The useful current bibliography is continued, and if our contemporary can hold its present form it should become firmly established.

Indian Journal of Medical Research. January, 1924.—W. G. Liston and M. B. Soparkar write upon bovine tuberculosis in India with special reference to an outbreak amongst the animals in the Bombay Zoological Gardens and the types of tubercle bacilli isolated.—N. L. Banerji has a paper on the influence of hydrogen-ion concentration on the dose of alum employed in the clarification of natural waters.—L. E. Napier describes the reaction of the blood in kala-azar.—R. Knowles and B. M. Das Gupta contribute a note upon a flagellate protozoon found in the saliva.—R. McCarrison continues his series of papers on the pathogenesis of deficiency disease.—A. J. H. Russell, A. Ayyar, and Urhaya make some epidemiological observations on an epidemic of relapsing fever in Madras Presidency.—J. A. Sinton provides a valuable contribution to our knowledge of the Indian species of phlebotomus.—U. N. Bramachari, S. C. Chaudhury, J. Das, and P. B. Sen write upon the chemotherapy of antimonial compounds.—P. J. Barraud continues his revision of the culicine mosquitoes of India.—N. H. Fairley and W. G. Liston commence a well-illustrated account of the pathology of dracontiasis.—W. S. Patton writes upon the occurrence of *Hypoderma lineatum* in the Punjab.—H. E. Shortt and C. S. Swaminath have succeeded in infecting a mouse by means of bed-bugs fed on the peripheral blood of a case of kala-azar.

Glasgow Eye Infirmary.—Dr. John Edwards presided at the hundredth annual meeting, recently held, of the Glasgow Eye Infirmary. In the course of his speech he traced the history of the infirmary from its inception in 1824 up to the present day, when it occupies a commodious building in the west end of Glasgow. Dr. W. Gillies intimated that there was a credit balance of £18,948 for the present year, as a result of a donation of £20,000 from Mr. John Ross's trust. Indoor patients had each cost on the average £6, while the expenditure on outdoor patients had averaged 1s. per patient. The centenary celebration will take place in June next.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

XI.—MEDICAL PARTNERSHIPS.

By James Neal, M.R.C.S. Eng.,
General Secretary of the Medical Defence Union.

More than most men the family physician feels the tragedy of isolation.—*William Osler.*

In these days of specialisation it is no longer easy for an individual medical practitioner to cope single-handed with the various aspects of disease met with in what is still called general practice. Twenty or thirty years ago medical practitioners were more generally content to practise independently.

Advantages and Drawbacks.

It is now realised that many advantages can be gained by coöperation, and it is not at all unusual to find multiple partnerships in which the different members of the firm specialise in various departments of medical work to the benefit of all concerned. A firm of medical partners which includes an operating surgeon, an obstetrician, an X ray operator, an oculist, and possibly an ear and throat specialist, is able to cope with almost any conceivable variety of ailment which may be met with in practice, without any necessity for calling in outside help, and therefore occupies a very strong position as compared with an isolated individual practitioner who must necessarily refer his patients to an independent specialist in many circumstances. Moreover, since the introduction of the Insurance Act, it has become more difficult for a young medical practitioner to acquire a practice by the simple process of putting up his plate. It is therefore not surprising to find that medical partnerships are becoming more numerous.

The advantages are obvious. Responsibility can be shared; the capital value of the practice can be maintained better; outside competition can be more easily met; holidays can be arranged without loss; and team-work can be carried on with all its benefits. It has to be admitted that a man who enters a medical partnership must be prepared to sacrifice a certain amount of independence; but the advantages to be gained are so great that there is no doubt the arrangement would become far more general, except for the unfortunate differences that not infrequently arise.

Experience in adjudicating in partnership disputes has convinced me that many of the difficulties peculiar to medical partnerships can be obviated. No medical partnership can be carried on satisfactorily unless there is mutual goodwill between the partners. Consequently, anything likely to become a cause of disagreement must be avoided studiously from the outset. Jealousy is perhaps the rock on which a medical partnership is most likely to be wrecked, and should be carefully guarded against. Mutual trust and loyalty are essential, and each partner should realise that he must play the game in the public-school spirit.

Nature of the Contract.

If a partnership is entered upon for a short fixed period, at the expiration of which both partners may continue practising in the place, not only is the saleable value of either partner's share negligible, but there is a distinct inducement to each partner to compete with the other for a hold on the patients. It is therefore preferable that the duration of a medical partnership should be for the joint lives of the partners, with provision for either partner to dispose of his share after giving the requisite notice; except in those cases where a brief partnership is arranged deliberately with a view to the acquisition by the junior partner, after a specified period, of the whole practice.

In all partnerships with a view to succession, it is desirable that the date of the retirement of the senior partner should be definitely stated in the agreement, and also the terms upon which his share in the partnership shall be acquired by his successor. An ordinary partnership should be terminable by either partner giving due notice at any time after the first few years; so that if either partner finds the partnership unsatisfactory it is possible for him to dispose of his share and thus withdraw from the partnership. It should, however, be an essential proviso that the retiring partner may not continue to practise in the district.

A medical practitioner who enters into partnership with one or more other medical practitioners necessarily finds himself bound by the ordinary obligations imposed upon any persons "carrying on a business in common with a view to profit." But a partnership between two or more medical practitioners differs in some respects from a partnership between persons engaged in any other profession or trade. Medical partners hold little joint stock; their principal partnership asset is the goodwill of the practice. Consequently, the profits of the partnership are not derived from the share which each partner has in the partnership assets, but from the professional work of each partner.

From the strictly legal point of view a partnership may be created by a verbal contract, or may even be inferred either from the fact that the profits of a joint business are shared, or that the parties allow their names to appear in such a way as to imply that they are carrying on the practice as partners. In all medical partnerships it is essential that a formal agreement of partnership should be entered into and signed before any act of partnership is performed. Too often as soon as a medical partnership is decided upon, the work of the partnership is allowed to commence before many necessary details are settled. I have known months, and, in some cases, several years, elapse before the actual legal agreement was even drafted. If any disagreement should then arise, the position may easily become extremely complicated, and disaster may result.

Drawing Up the Agreement.

The agreement of partnership is a most important document. It should invariably be prepared by a solicitor who is experienced in the peculiar difficulties which are likely to arise in connexion with medical partnerships, and who is therefore able in a great measure to guard against them. The slightest ambiguity in the wording of a clause in the partnership agreement frequently leads to serious differences between the partners, and may even make the continuance of the partnership impossible.

All partnership agreements should define:—

1. The duration of the partnership.
2. The terms on which the share of the incoming partner is to be acquired, and the terms on which his share may be increased from time to time.
3. The mutual rights and duties of the partners.
4. The property of the partnership.
5. The expenses to be met by the partnership.
6. The fees to be charged.
7. The terms of dissolution in varying contingencies, including the restrictions to be imposed on a retiring or outgoing partner.
8. The procedure to be adopted in the event of any disputes between the partners.

Other matters properly to be included are provision for the keeping and auditing of the accounts, for periodic division of profits, for holidays, and for dealing with prolonged absence or incapacity of either partner. Whenever a medical practitioner contemplates entering into a partnership, a careful investigation of the books of the practice should be made by a competent accountant, experienced in medical book-keeping. This is as essential as when a practice is to be bought outright, but is a precaution too frequently dispensed with. It is also well to make sure that a prospective partner is a duly registered medical practitioner. There are several cases on record where an unqualified person has successfully represented himself to be registered, and has been taken into partnership without any suspicion being aroused or inquiries made.

A partnership agreement may always be varied by the consent of all the partners. Many difficulties and disputes would be avoided if any departure from the strict letter of the partnership agreement made with the consent of all the partners were recorded in writing, as frequently such consent may be inferred from the circumstances of the case. It has been held in some instances that the constant usage of partners is sufficient to supersede the articles of partnership. This must not, however, be taken to mean that an occasional failure to comply with the strict letter of the agreement invalidates the written provisions.

Reciprocal Responsibility.

Every partner is entitled to take his share in the management of the business of the partnership, and is under an obligation to devote himself diligently to the work of the practice. Special importance attaches in the case of a medical partnership to the following clause in the Partnership Act, 1890:—

§ 10. Where, by any wrongful act or omission of any partner acting in the ordinary course of the business of the firm, or with the authority of his co-partners, loss or injury is caused to any person not being a partner in the firm, or any penalty is incurred, the firm is liable therefor to the same extent as the partner so acting, or omitting to act.

This means that each partner in a medical firm will be responsible for any other partner's negligence or malpraxis. It is consequently usual to include in a partnership agreement a clause whereby each partner is required to make good any loss occasioned to the firm by negligence or misconduct on his part. The most desirable arrangement is to stipulate that all the partners should be and remain during the continuance of the partnership members of one of the medical defence societies, and preferably that all should belong to the same society.

It is usual for each partner to provide his own surgical instruments, and also to provide his own means of locomotion. But special arrangements must be made in exceptional circumstances.

Division of Labour.

The division of the work among medical partners is a matter of arrangement, but the general principles should be decided beforehand, and embodied in the agreement. When a younger man is taken into partnership by an established practitioner who wishes to be relieved of some of his work, it is only right that the senior partner should decide largely which cases should be seen by the junior. This does not mean that the junior should be treated as an assistant, and many promising partnerships have been ruined by unfair treatment in this respect. The junior must reasonably expect to be given the less important work for a time, but his rights as a partner must not be infringed. For instance, it would be unreasonable for the senior partner to expect his junior partner to take all night calls and midwifery, unless it was a special arrangement agreed to before the partnership was entered into, in which case it should be embodied in the Articles.

The position is different when the partnership has been arranged with a view to the succession of the junior within a comparatively short period. His effective introduction is essential to the proper transfer of the goodwill, and must not be unduly delayed. A judicious arrangement of the work with due regard to the susceptibilities of the patients should be possible, and must be insisted upon. When there are more than two partners, any difference arising as to ordinary matters connected with the partnership business may be decided by a majority of the partners.

Assistance with a View to Partnership.

No one should consent to act as an assistant with a view to partnership on a mere verbal assurance that he will eventually be admitted into partnership. Too

often it is found that the intentions of the principal change, and that after repeated delays some more or less imaginary reason is advanced for not carrying out the original intention. When a preliminary service as an assistant with a view to partnership is suggested, it is well to insist that a definite agreement for partnership to commence on a future date specified in the agreement shall be entered into and signed by both parties. To guard against incompatibility, liberty should be given to either party to cancel the agreement within a specified period, not exceeding six months, in which case the proposed partnership would be nullified.

CERTIFICATION IN INSURANCE PRACTICE.

Dr. J. Hedley Marsh, of Macclesfield, comments as follows on the article by Mr. L. Shoeten Sack which appeared in THE LANCET of March 1st, p. 450:—

"Mr. Shoeten Sack states that where a doctor neglects to grant an intermediate certificate within 24 hours of seeing the patient he should not use the new voluntary certificate, but should use the 'regular form of certificate.' If by regular form of certificate he means form Med. 40 revised, he is, I believe, in error. The doctor should give one of his own private certificates or write on a plain piece of paper. Rule 8 is quite explicit, and the Commissioners' ruling in a recent case here in Cheshire forbids the use of the official form Med. 40, except as expressly laid down. The whole question of certification is a nightmare to the conscientious practitioner. It now requires a barrister-at-law to interpret its verbiage, and even with his help a wrong construction may be placed on the official jargon."

Mr. Shoeten Sack replies: "Rule 8, considered by itself, might suggest this interpretation. Rule 2, however, limits the use of the prescribed forms of certificate by providing that these forms 'shall not be used on any occasion on which the practitioner is not required by these Rules to give a certificate.' This clearly prohibits their use where the insured person is himself responsible for a delay in the issue, for in such a case the doctor is not 'required' to give a certificate but may use the voluntary or a private certificate as an act of grace. Article 2 does not, however, seem to exclude the issue of a regular certificate where the patient has made due request, and the doctor has neglected to give the certificate within 24 hours; for then, in spite of his dilatoriness, the doctor is still 'required to give a certificate.' Rule 8 merely defines the doctor's obligation as to the time when the certificate is to be issued. If, after due request, the doctor neglects to issue the certificate within 24 hours of the examination, he admittedly commits a breach of this rule, but the insured person still remains entitled to receive the regular certificate for which he asked at the proper time. If it were otherwise, what would become of the requirements in Rules 3, 4, and 5 that the doctor *shall*, if desired by the insured person, issue a first or intermediate certificate? The breach by the doctor of Rule 8 cannot be held to render the other rules of no effect.

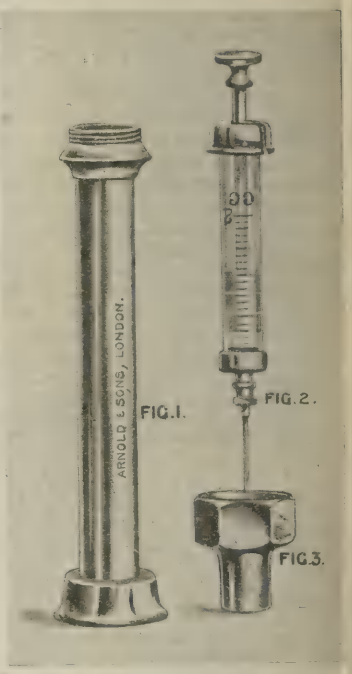
"In the memorandum, Form G.P. 37, which was sent to insurance doctors when notice was given of the altered terms of service under the Medical Benefit Regulations, 1924, the Minister of Health thus explains the point (para. 10(*c*)): 'It should be specially noted that they [the voluntary certificates] cannot properly be used in cases in which the practitioner was himself at fault in not issuing within the required time a certificate which it was his duty to issue. In cases where the patient was not at fault but the doctor has omitted to give or send a certificate within the time specified in Rule 8, an ordinary official certificate should be issued, showing the date of examination and the date of signing.' The 'ordinary official certificate' in this passage means any of the prescribed forms of certificate other than the voluntary certificate, and therefore, of course, includes Form Med. 40 revised.

"The Cheshire case which Dr. Marsh quotes was presumably either a case which arose before the introduction of the voluntary certificate, or it referred to the issue of Form Med. 40 where the insured person himself was at fault through having neglected to ask for a certificate at the proper time."

New Inventions.

A NEW INSULIN SYRINGE.

THE repeated injection of insulin frequently causes inflammatory reaction and a hardening of the tissues. With the ordinary Record syringe and needle this causes a marked resistance to the injection of the fluid, and in many cases there is a loss of from 3 to 4 minims of insulin past the plunger of the syringe. When to this is added the necessity of continued sterilisation, repeated daily injections may become very irksome. I have had devised a syringe and holder to overcome these difficulties. The syringe is a 2 c.cm. Record armed with a No. 19 or 17 needle. The plunger is grooved to hold two well-fitting spring piston rings, the gaps in which are so adjusted as not to be in line. This syringe (Fig. 2) will hold a very high degree of compression, and will not leak past the plunger. The container of the syringe is a metal cylinder with an alcohol-tight screw cap. The syringe is kept in absolute alcohol within the container and is always sterile. The fitting of the cap is so arranged that it is not necessary to have any leather or rubber washers, and yet is perfectly spirit-tight. The metal container (Fig. 1) has a wide, flat, heavy base and will stand upright. The screw cap (Fig. 3) has also a flat top, carries a spring which holds the syringe immobile in the container, and is sufficiently deep to hold a drachm of alcohol. The syringe is admirably adapted for the injection of any fluid against great resistance. The idea has been applied to a series of syringes of varying sizes for different uses. In my hands their use has been uniformly pleasing.



The syringes are made by Messrs. Arnold and Sons (John Bell and Croyden, Ltd.), 50–52, Wigmore-street, London, W. 1.

Welbeck-street, W. TILSON DINNICK.

GROCERS' COMPANY'S RESEARCH SCHOLARSHIPS.—With the object of encouraging original research in sanitary science, the Grocers' Company offer three scholarships each of £300 a year, with an allowance to meet the cost of apparatus and other expenses in connexion with the work. The scholarships are tenable for one year, but renewable for a second or third year, subject to the conditions of the scheme under which they are established. The next election will take place in May, 1924, one scholarship being now vacant. Applications must be sent in before April 1st to the clerk of the Grocers' Company, Grocers' Hall, London, E.C. 2, from whom a form of application and further information may be obtained.

THE LANCET.

LONDON: SATURDAY, MARCH 15, 1924.

THE SYSTEMIC EFFECTS OF RADIATION.

FOR a long time after the destructive effects of X rays and radium on various kinds of pathological cells had been ascertained, attention was concentrated upon this action rather than upon the physiological effects of radiation on the tissues in general, and it is only within the last three or four years that the dangers attending the use of gamma rays are being fully revealed. Superficial damage to the skin caused by the softer types of X rays, and resulting in dermatitis or something worse, was the first to attract general notice; more recently the damage done to the deeper structures including the blood-forming organs by the more penetrating types of X rays and the gamma rays of radio-active substances has been observed. Taking the skin as a type of tissue moderately vulnerable to radiation, we can now classify tissues roughly into those of greater and lesser vulnerability—on the resistant side, muscle and nerve tissue; on the susceptible side, blood-cells and germinal tissue; and to the latter must now be added the cells lining the alimentary canal. In a recent article [1] allusion was made to some valuable American studies on X ray intoxication with special bearing on radiation of the abdomen. Experiments on dogs showed that a dose of X rays which, directed over the thorax, gave no clinical evidence of intoxication, ensured the death of the animal on the fourth day if given over the abdomen. Going further, it was found that in dogs the secretory crypt of epithelium of the small intestine was the first to undergo autolysis. These experiments gave no support to the belief that X ray nephritis might be produced by hard Rontgen rays, since the epithelium of the kidney was found to be much more resistant than the epithelium of the small intestine.

We publish this week a study of the metabolic changes associated with X ray and radium treatment undertaken by Dr. E. C. DODDS and Dr. J. H. DOUGLAS WEBSTER, who recount the results of a piece of laborious work which was completed in August of last year. The machinery of two scientific departments at the Middlesex Hospital was set going to determine the essential biochemical changes involved in radiation toxæmia, or X ray sickness as it has graphically been called. The aim of the research was to determine, by a study of basal metabolism, what are the characteristic changes in radiation toxæmia, in order to bring these changes into relation with other comparatively well-known toxæmias such as those occurring during anæsthesia, in the course of diabetes, as a result of fevers, migraine, uræmia, and the like. A primary difficulty in this investigation, which was carried out entirely upon the human subject, was to appraise correctly the three factors necessarily complicating the results—namely, the disease in question, the effect of treatment on the disease, and finally the effect of the rays on the patient's metabolism. Four clinical groups of disease were investigated, the patients being in bed and maintained on constant diet, while the urine collected in 24-hour specimens was completely analysed for urea, uric acid, ammonia, acidity, total nitrogen, ammonia coefficient, phosphates, chlorides, creatinin, and diastase. The results of all these clinical findings coincided in a remarkable degree with those obtained experimentally in animals by the American observers. The changes in metabolism, closely similar whether X or gamma rays were employed, were found to vary essentially with the site radiated. Radiation of head, thorax, or limbs produced no appreciable change in metabolism. Radiation of the cervical region produced no change other than an immediate fall in the urinary creatinin, attributed by the authors to temporary paralysis of the parathyroids. On the other hand, radiation of the abdomen and spleen produced definite urinary and blood changes which are set out in tabular form in the authors' article. The metabolic changes can be best explained by a temporary inhibition of the functions of the three principal abdominal glands—namely, the liver, pancreas, and kidneys—the fall in urea content of the blood being outside the picture. The figures give no support to the theory of acute uræmia recently enunciated by ANDERSEN and KOHLMANN, which was the starting-point of the authors' investigation; but they do give some support to LANGE'S theory of acidosis, in view of the fact that the ammonia coefficient definitely rises as a result of radiation.

In the light of the metabolic changes which they observed, Dr. DODDS and Dr. WEBSTER suggest the possibility of prophylactic measures, which are to form the basis of a further investigation. Administration of calcium chloride or sodium bicarbonate before radiation has already in some cases resulted in a diminution of the ensuing reaction. The whole plan of work should be studied very carefully by all who are occupied with the application of X rays or radium to any part of the body, for the authors discuss in an objective and dispassionate manner all the theories hitherto advanced to explain the incidence of radiation toxæmia, and their scholarly contribution should materially clear the way for later workers. The discussion on the clinical results of deep X ray therapy, announced for March 21st at the Royal Society of Medicine, will benefit by starting from some such sound pathological basis.

[1] THE LANCET, Feb. 16th, p. 344.

PROPOSED ALTERATIONS IN THE LAW OF THE FAMILY.

PARLIAMENT has before it at the present moment an unusual number of measures affecting the law of the family. Of these Lord BUCKMASTER'S Legitimacy Bill has perhaps the most hopeful prospects, for both the Prime Minister and the Lord Chancellor have stated that it has the approval of the Government. If the principle of *legitimatio per subsequens matrimonium* is now adopted in England, it will repeal one of the oldest Acts on our statute-book; but very few other countries have agreed with us on the point, and we ourselves would probably have changed our law last year but for the dissolution of Parliament. Lord BUCKMASTER proposes that "legitimated persons" shall be able to inherit property on intestacies, and that in future wills the words "child" or "issue" shall include legitimated children unless the contrary intention is expressed. Lord PHILLIMORE would reject the clause which says that the Bill shall not affect the succession to dignities or titles. It certainly seems odd that one person should inherit the ducal estates while another person becomes the duke. In Committee, however, Lord GORELL'S amendment to omit the clause was defeated. The Archbishop of CANTERBURY succeeded in narrowing the Bill to

cases where both parents were unmarried when the child was born. A similar stipulation appears in Mr. WIGNALL'S Illegitimacy Bill, which proposes to consolidate and amend the Bastardy Acts and kindred legislation. This Bill must expect sharp opposition, for in affiliation proceedings it would abolish the need of corroboration of the story of a woman who is the mother of, or believes herself to be pregnant with, an illegitimate child. Some of its provisions might open the door to blackmail.

The Matrimonial Causes Bill is another House of Lords Bill sponsored by Lord BUCKMASTER. It claims to be based on the majority report of the Royal Commission of 1909 presided over by Lord GORELL. In one respect it is not so drastic. The majority report (published in 1912) would have allowed judges to close the court in divorce cases and to order specific parts of the evidence or speeches not to be published; it recommended that no report of a divorce case be published till the case was finished, that all photographing or sketching of parties or witnesses should be forbidden, and that breaches of these provisions be treated as contempt of court. Lord BUCKMASTER merely provides for closing the court at discretion. In more vital matters he accepts the Royal Commission's views completely. The sexes are to be on an equality in divorce proceedings. There are six grounds for divorce: (*a*) adultery; (*b*) desertion for three years; (*c*) cruelty; (*d*) incurable insanity (after five years' confinement); (*e*) habitual drunkenness found incurable after three years from the first separation order; and (*f*) imprisonment under commuted death sentence, to which he adds also confinement in a criminal lunatic asylum. The grounds for pronouncing nullity of marriage are four: (*a*) non-consummation; (*b*) marriage by person of incipient mental unsoundness becoming definite within six months, or by a person who is epileptic or insane; (*c*) venereal disease existing at date of marriage; and (*d*) pregnancy of the wife at date of marriage by some man other than the husband. Under (*b*), (*c*), and (*d*) the applicant must have been ignorant of the facts at the date of marriage, must not have had marital intercourse since discovery of the truth, and must have instituted proceedings within a year of the marriage. Separation orders obtainable from magistrates are limited to two years, after which an extension may be obtained from the High Court; these temporary orders may be granted for cruelty, habitual drunkenness, or venereal disease. Separation and maintenance orders in their summary jurisdiction aspect are also the subject of a Bill brought forward by Sir ROBERT NEWMAN. The latter allows a married woman to apply for an order on the ground of her husband's cruelty and neglect, notwithstanding that such treatment has not caused her to leave him. There is another clause assisting a wife who is driven to prostitution by a husband whose conduct is likely to result and has in fact resulted in her degradation. Adultery by the wife at present discharges an order. Sir ROBERT NEWMAN proposes that this discharge shall not be automatic if the court considers that the husband's failure to make his payments has conduced to the adultery; and, where the magistrates do discharge the order, they may make a fresh order giving the wife the custody of the children and directing the husband to contribute weekly to their maintenance. With Parliamentary time limited by financial debates and by special difficulties of other kinds, it is hard to estimate the chances of changing the law on these points, but it will be recalled that a measure to amend the law of separation and maintenance orders was included in the King's Speech in January.

Mrs. WINTRINGHAM'S Guardianship of Infants Bill is not yet available for perusal. Both Sir M. MACNAGHTEN and Sir THOMAS INSKIP have presented Adoption of Children Bills. The latter's is the shorter and more workmanlike; it provides for the adoption of children under 10 with the approval of the High Court or county court, the court being directed to have regard solely to the interests of the child. The law affecting the family would be strengthened in many respects if the Children Bill were passed which we have previously discussed. In his capacity as private member Mr. AMMON has brought in an Offences against the Person Bill, which goes over again much of the ground covered by the Children Bill, and is perhaps unlikely to make much progress. As both these Bills have important clauses relating to criminal assaults upon young people, it may be hoped that the draftsmanship is satisfactory. The Criminal Law Amendment Act of 1922 had not been many months in force before the Court of Criminal Appeal found that its interpretation involved consequences both favourable and adverse to offenders which Parliament could never have intended. Proposals which are not likely to experience judicial criticism of this kind are contained in the Criminal Justice Bill, which is founded on solid professional and judicial support. The Bill, inter alia, would remove the legal presumption that a wife who commits an offence in the presence of her husband has acted under coercion from him. This presumption is not recognised outside England and is unsuited to an age of sex equality. If it disappears, it will still be possible for the jury to find that in the facts of the particular case the wife was so coerced by her husband. There remains one proposal which will raise less stir than it would have evoked before the passing of the Deceased Wife's Sister Act of 1907 or the Deceased Brother's Widow Act of 1921. Mr. RENDALL'S Marriage (Prohibited Degrees of Relationship) Bill would allow marriage with a deceased wife's brother's or sister's daughter or a father's or mother's deceased brother's widow, or, in plain English, marriage with persons who are nephews or nieces by marriage. Sufficient unto the day when the Bill becomes an Act are the complicated relationships which may ensue from such unions. For some of the prospective measures mentioned above a precedent could be cited from some other part of the Empire. If the Imperial Parliament is beginning to give marked attention to proposals of social reform specially affecting family life, much of the credit must undoubtedly be given to the feminine portion of the electorate, whose numbers it has recently been proposed to enlarge.

THE ACID-BASE BALANCE OF THE BLOOD.

THE automatic adjustments of the human body have often been an object for envy on the part of laboratory workers who find it difficult from a mass of conflicting influences to achieve a constant result. In whatever direction and for whatever length of time the balance is disturbed, there is an invincible tendency to return to the physiologic norm as soon as the disturbing influence is eliminated. This has long been evident with regard to the regulation of the body heat; it is only of recent years that it has been shown to apply to the chemical reaction of the tissues. The exact range of hydrogen-ion concentration of the blood serum which may be considered normal is still in dispute, although it probably lies

between the variations represented by pH 7·3 and pH 7·5. Under exceptional conditions these limits may be exceeded, but a return to normal is rapid and automatic; the extreme variations compatible with life appear to be on the acid side pH 6·9 and on the alkaline side pH 9·0. Beyond these limits presumably life is impossible. The latter figure has only been seen under experimental conditions, and it is probable that a figure of 7·9 is rarely, if ever, exceeded. Wide variations occur in the course of disease and similar variations have been produced experimentally in man. Some remarkable results obtained on himself and colleagues at Oxford and Cambridge were given by Mr. J. B. S. HALDANE at a recent meeting of the Section of Therapeutics and Pharmacology of the Royal Society of Medicine, and are summarised in our present issue. Mr. HALDANE produced acidosis by the ingestion of large doses of ammonium chloride and alkalæmia by similar doses of sodium bicarbonate. After taking 45 g. of $NaHCO_3$ he found that the alkali reserve of the blood might be increased by 20 per cent., the blood becoming more alkaline and ammonia disappearing from the urine. After taking 65 g. of NH_4Cl spread over a period of three days the alkali reserve was reduced to less than half of the normal, the calcium content of the serum rose by 10 per cent., and the excretion of Na, K, Ca, and P was vastly increased. When he took NH_4Cl the body-weight was found to drop sharply and the hæmoglobin in the blood to rise, owing probably to physical change in the body colloids. Dr. ARTHUR ELLIS, who contributed to the same discussion, narrated the case of a patient suffering from alkalæmia as a result of pyloric obstruction who was given three-hourly 10 oz. of 2 per cent. ammonium chloride per rectum for four doses, or about 22·5 g. in all. Before treatment tetany and general convulsions were occurring, the pH of the plasma being 7·6 and the plasma bicarbonate standing at 120. Twelve hours later tetany had disappeared, muscular irritability was greatly diminished, although still present; convulsions had ceased. The plasma pH was then 7·4, the plasma bicarbonate 76. The interesting question remains to decide how long variations in hydrogen-ion concentration artificially produced are maintained. There can be little doubt that by hot baths the alkaline concentration of plasma may be increased to an extent greater than pH 0·1. This was shown by some experiments made by H. C. BAZETT and J. B. S. HALDANE in 1921.[1] Such a change would, however, merely be temporary and the effect would disappear as soon as the individual ceased the over-breathing caused by the temperature of the hot bath. No evidence has been submitted to suggest that the alteration would benefit the patient. The drinking of saline waters in usual quantity and dilution is hardly likely to effect any alteration in the hydrogen-ion concentration of the plasma, inasmuch as the bodily mechanism for dealing with excess acid and alkali is too efficient to be upset by such a relatively insignificant excess in the daily intake of base. Other physical agencies may, however, do so; radiation, for instance, has been shown to produce a temporary disturbance of the acid-base balance in the body.

BY an Order of Privy Council, dated March 3rd, Mr. Edward F. L. Wood, M.P., and Mr. A. G. Church, M.P., have been appointed members of the Medical Research Council. Mr. Wood is appointed to succeed Viscount Goschen, chairman of the Council, who has resigned owing to his appointment as Governor of Madras, while Mr. Church takes the place of Mr. William Graham, M.P., who has resigned his membership of the Council on becoming Financial Secretary to the Treasury.

[1] Journal of Physiology, 1921, iv., 55.

Annotations.

"Ne quid nimis."

REMINISCENCES OF PAUL EHRLICH.

HAD he lived, Ehrlich would have been 70 on March 14th of this year. This anniversary is celebrated in a book [1] in which his private secretary, Frl. Martha Marquardt, pulls the curtain aside and shows us Ehrlich as he was at home and in his laboratory. We see, not the impersonal giant of science, but a most human person, with the oddities and eccentricities which, when we see them in our fellow beings, make us laugh and love them the more. The picture of Ehrlich, in constant warfare with his cuffs, is obviously drawn by one whose sex usually guarantees immunity from the discomforts of the floating wristband. Ehrlich would stack his cuffs on a hook behind the door, but sometimes, when he had occasion to resume them, they would be left in place while he wrote or worked with test-tubes, and ever with ceaseless patience he would shake his prolapsed cuffs back with unconscious gestures. At other times he would hold both arms aloft and shake them, hoping that force of gravity would succeed where more than a hundred instinctive jerks had failed. His right-hand man, Kadereit, was everywhere and did everything, from opening his letters to attending to the numberless duties of a laboratory assistant. When Kadereit spoke of "our having discovered salvarsan," he gave expression to the sense of coöperation which Ehrlich's fellow workers enjoyed. Ehrlich had a reputation for forgetfulness in some directions, but he had a positively uncanny remembrance of where he had placed or misplaced things; he knew all about the contents of his numberless bottles, where to find a reference in a stack of books, and where to unearth odd sums of money he had tucked away. Sometimes there were no such sums to tuck away, for his cigar and book bills were heavy. His favourite books were detective novels, but even a tale of romantic crime did not fix his attention enough to prevent his making, on their pages, marginal notes of chemical formulæ. His sense of music, judged by the ordinary standards, was elementary; he loved the "music" of a barrel organ, and at home after dinner he would get his wife to play simple airs and light waltzes, and the simpler and lighter the music, the more pleased and cheerful he would become. It was at moments such as these that his best ideas came to him. Serious music depressed him, and he would revive from its effects only after a rollicking refrain from "Carmen" or some other favourite. After walking about under the cheerful influence of this music, he would sit down to a game of patience, puffing at the inevitable cigar. He would then proceed to jot down notes of the ideas that had come to him, filling many writing pads. He looked upon this work as the most productive of the day, and it was not till after midnight that he would leave the smoke-laden atmosphere of his working-room, and in his bedroom he would often continue reading and making notes till far into the night. There was only one evening in the week when he did not beg his wife to play to him. This was Sunday evening, when a 30-pfennig copy of the last number of a detective magazine formed an irresistible counter-attraction. About Christmas, 1914, he had a slight stroke, the immediate effects of which passed off in a few days, but he was left a silent and abstracted man. He was deeply distressed over the war, anticipating many of the troubles it would bring to all, and a break in his scientific coöperation with friends abroad. But to the end of his life he sometimes spoke with enthusiasm about future lines of research, and once remarked that even if he did nothing further himself, there were enough ideas jotted down in his note-books to give employment to a dozen chemists for

[1] Paul Ehrlich als Mensch und Arbeiter. By Martha Marquardt. Berlin and Stuttgart: Deutsche Verlags-Anstalt.

years under his direction. A second stroke on August 20th, 1915, suddenly terminated the career of one of the benefactors of mankind.

VENEREAL DISEASE AMONG MENTAL DEFECTIVES.

THE Mental Hospitals Committee of the London County Council has taken exception to a paragraph in the recently published report of the Government Committee on the Prevention of Venereal Disease which runs as follows :—

"There are found to be a considerable number of persons suffering from venereal disease among mental defectives, and the present arrangements for their control and treatment are inadequate."

The committee recognises that there may be an increased risk of venereal infection among the mentally defective, who lack the power of self-control, which tends in the normal person to sexual continence or at least to the taking of safeguards, and it is the committee's experience that mentally defective girls, if not carefully and wisely controlled, are prone to moral lapses. They, however, point to the reports issued by Sir William Hamer, who has emphasised the fact that there is comparatively little evidence as regards the incidence of primary venereal disease amongst the mentally defective, and that the number of defectives notified under the Mental Deficiency Act—and it is with these alone the L.C.C. is directly concerned—who have been found to have the disease is small and confined to cases notified from refuges, hostels, hospitals, or prisons. The L.C.C. committee is of opinion that the measures contemplated by the Act for dealing with defectives—e.g., supervision or institutional care or guardianship—should give all necessary protection against risk of venereal infection to those who are dealt with. If a defective under supervision or guardianship cannot be kept under such control as will keep him or her free from infection, institutional care ought to render the risk negligible. There may, however, be a difficulty with high-grade cases of mental defect whose social circumstances are such that they cannot be regarded as subjects to be dealt with by the local authority, and who therefore do not come within the purview of the Act. The Mental Hospitals Committee finally state that, as far as their own experience goes, there does not seem to be any special justification for the very wide statements made in the paragraph quoted.

JAUNDICE IN ENTERIC FEVER.

MM. Garnier and Reilly[1] remark that the idea of a typhoid or paratyphoid origin for the majority of cases of acute jaundice was at one time widely accepted in France, so that in any case of acute jaundice examination of the blood and stools for organisms of the typhoid group as well as Widal's test was always carried out. The discovery of *Spirochæta icterohæmorrhagiæ* threw new light on the pathogenesis of infective jaundice, but the origin of the most frequent variety of acute jaundice—viz., the catarrhal or acute apyretic form—remained obscure. In a study of 1300 cases of acute jaundice the writers found only four which could be attributed to typhoid or paratyphoid infection, so that they have come to the conclusion which agrees with the observations of the old clinicians that jaundice is extremely rare in enteric fever. The symptoms were identical in their four cases. The clinical picture was that of typhoid fever complicated by jaundice, which was always of slight degree and accompanied by the ordinary symptoms of typhoid infection. The discrepancy between the writers' observations and those of previous observers is to be explained by the fact that the laboratory tests employed by the latter were unsatisfactory in a large number of cases. As regards the outbreaks of epidemic jaundice which occurred in the war—e.g., in the Anglo-French armies at Gallipoli in 1915 and later in the French army in Macedonia, the Roumanian army in the Balkans, and the Italian army on the Isonzo—Sarrailhé and Clunet, and Cantacuzène and his collaborators attempted to make paratyphoid bacilli responsible owing to the frequency of bacilli of the paratyphoid group in the blood and stools. The writers, however, point out that the organisms were atypical. Thus, in the Roumanian epidemic the organisms isolated belonged to 14 different strains. Moreover, the extreme degree of contagiousness and the short duration of the incubation period completely differentiated the disease from enteric. The frequency of epidemics of jaundice in the Roumanian troops who had been inoculated against enteric fever and their absence in the uninoculated Turkish soldiers cannot be explained, as Sacquépée suggests, by the paratyphoid infection showing a preference for incompletely immunised subjects, as jaundice was rarely observed during the paratyphoid epidemic in the incompletely immunised French army during 1915 or in the cases of typhoid infection among the inoculated observed by Bernard and Paraf, Labbé, Rist, and others. The writers remark that the view of the paratyphoid origin of epidemic jaundice is by no means so popular in other countries as in France; it has been rejected by C. J. Martin and Sir William Willcox in England, Benczur and Beyreis in Germany, and Kampf and Wornoe in Denmark. The writers conclude that jaundice in enteric may be met with under two different conditions—viz.: (1) exceptionally in patients with typhoid or paratyphoid running an ordinary course, (2) more frequently in individuals who have been subjected to a massive infection either accidentally, as in alimentary intoxication, or experimentally, as was carried out by Cantacuzène.

[1] Paris Médical, 1923, ii., 229.

THE SANATORIUM AS A RESEARCH CENTRE.

IT would probably be unwise to accept as more than a caricature the picture of a sanatorium superintendent presiding over a cabbage patch, on which patients practise graduated labour, fulfilling his duties as a sort of house physician to the outside tuberculosis officer with the zeal, or want of zeal, that a subordinate station in life evokes. But the administrative blunder which has robbed the sanatorium superintendent of the last word as to the duration of a patient's residence in a sanatorium has inevitably acted as a brake on therapeutic initiative and independent research requiring continuity of observation in certain individual cases. It is therefore a pleasant surprise to find that, in spite of this obstacle, important research is being carried out here and there by enterprising sanatorium superintendents with a scientific bent. An example of such work is to be found in the fifth annual report of the Glenlomond Sanatorium, Kinross. The medical superintendent, Dr. W. T. Munro, has evidently followed the recent investigations in Berlin by Prof. Uhlenhuth, on whose observations on immune sera in the treatment of tuberculosis we have recently commented.[1] Dr. Munro has attempted to reduce the pulse-rate in very toxic cases by injecting the serum of patients who were doing very well. Naturally due regard was paid to the blood groups, and only Wassermann-negative sera were used. In one case the patient's pulse was reduced from an average of 110 to 80–88 every time serum was given. On the suggestion of Sir Robert Philip inunction with a tuberculin ointment has been given in cases of tuberculosis of the glands, and Dr. Munro writes that "we are more impressed with the treatment of massive tuberculous glands by this means than by any other." At the time this report was written about 30 patients were undergoing treatment with Prof. Dreyer's diaplyte vaccine, but of the value of this remedy Dr. Munro reserves his opinion. Of other

[1] THE LANCET, 1923, ii., 943.

modern remedies, collosol calcium has been given an extended trial and has been given up. Dr. Munro has, indeed, never found any drug of any material value in the treatment of pulmonary tuberculosis, and this is a verdict with which probably most sanatorium physicians would reluctantly agree. Some curious observations were made in six cases of hæmoptysis. In every case a hæmolytic streptococcus was found in the sputum, and after these patients had been treated with autogenous vaccines, all improved, and not one has again had an hæmoptysis. Several cases of asthma were investigated on the lines laid down by Noon and Freeman, and an interesting case is related of an epileptic patient who was found sensitive to a coliform bacillus passed in the urine, and who was given an autogenous vaccine. Under this treatment the fits, which had occurred on an average twice a day, were reduced to one per week, tubercle bacilli disappearing from the sputum and the weight increasing by a stone. The serological characteristics of 100 specimens of tubercle bacilli, obtained from the patients' sputum, have been investigated and found to belong to one and the same group. The Fife and Kinross Joint Sanatorium Board is associated in its scheme of research with Prof. W. J. Tulloch, of Dundee, and this association is doubtless of reciprocal value. There are few sights more pathetic than that of a research worker ploughing a lonely furrow without the benefit of that stimulus which rubbing shoulders with other workers provides. And the value of the sanatorium as a research centre is doubtless greatly enhanced by its being linked up with some other centre at which observations can be checked and verified.

EYELESS SIGHT.[1]

Jules Romains, less known as a physiologist than as a dramatist and literary artist who is not altogether enthusiastic about the medical profession, believes that the general skin surface of the body and some of the adjacent mucous membranes are capable of vision in the sense that completely blind or blindfolded people may recognise colours, persons, geometrical forms, and even read the newspaper by means of their skin. He identifies as accessory eyes some of the many varieties of end-organs in the skin whose precise function has never been determined. The phenomena which he describes are certainly striking. There is no inherent impossibility in the idea that the skin is responsive to the wave-lengths in the ether which we recognise as light, and if there are receptors scattered over the surface it is conceivable that these impressions might be translated into conceptions of external appearances. But a world steeped in the dogmas of physiological optics will require more rigorous proof than the author advances. One pitfall at any rate is quite insufficiently fenced-off. With one exception, the experiments which he cites take no account of telepathy, the object or word or numbers presented to and recognised by, e.g., the chest of the subject being known to someone else who was actually present. If he would take Prof. Richet into collaboration, we could be sure this source of error would be adequately excluded. That telepathy is the explanation of his results is certainly supported by his observation that some degree of attention and the correct frame of mind are necessary for success. The same is, of course, true of common ocular vision, and Mr. Romains makes several points which are frankly against a telepathic interpretation. Success varies roughly with the area of skin exposed, and the skin cannot see in the dark (though the experiments on this point seem a little vague), nor if anything opaque to ordinary light is interposed between it and the object. There is nothing remarkable in his observation that paroptic sight is possible only in the complete absence of ordinary visual sensations. On his thesis in general the only possible comment seems to be, "It may be so." People talk easily of the blind men who find their way so quickly and surely about the streets having developed another sense. Perhaps Mr. Romains has identified it.

[1] Eyeless Sight: A Study of Extra-retinal Vision and the Paroptic Sense. By Jules Romains (Louis Farigoule). Translated by C. K. Ogden. London and New York: G. P. Putnam's Sons. 1924. Pp. 228. 5s.

GANGRENE OF EXTREMITIES IN PUERPERAL FEVER.

Dr. Victor E. Chesky,[1] of Halstead, Kansas, who records an illustrative case, remarks that puerperal peripheral gangrene, while not common, is liable to occur in any case of puerperal sepsis or septic abortion. Stein in 1916 collected 76 cases, including two of his own, in 63 of which gangrene followed labour, and in four septic abortion, while four occurred during pregnancy, and five followed gynæcological operations. Knipe in 1917 recorded another case following septic abortion, so that with Dr. Chesky's case there are now 78 examples of obstetrical or gynæcological interest on record of gangrene of the extremities. In most cases one or both of the lower extremities was involved. Much less frequently the upper extremities were affected. In only one instance was there symmetrical gangrene of the fingers, toes, and ears. The causative factor in puerperal peripheral gangrene is always infection, which may vary from a very mild form with a low temperature lasting only a few days to the most severe type of puerperal sepsis. Either a streptococcic or a mixed infection is present. The circulatory block is usually situated in the arteries. Puerperal gangrene of venous origin is relatively rare. Contributory causes of thrombosis are low blood pressure and sluggish blood-stream, caused by severe hæmorrhage or weakened heart action, recumbent position and relative immobility of the body, lowered resistance against infection, and abnormal constitution of the blood. The prognosis is bad, the mortality being about 50 per cent. Early amputation of the gangrenous part is the most important step in treatment. Dr. Chesky's case occurred in a vigorous primipara, aged 19, in whom puerperal sepsis developed on the day after delivery. Five days later she complained of numbness in both feet, which became swollen. Dry gangrene of the toes developed and complete recovery followed their removal. Dr. Chesky attributes the gangrene in his case to arterial occlusion, the thrombus being localised in the pelvic vessels.

[1] Surgery, Gynecology, and Obstetrics, January, 1924.

PURE ETHER.

Prof. Storm van Leeuwen, of Leiden University, in his paper to the Section of Anæsthetics of the Royal Society of Medicine on Friday of last week gave some conclusive evidence as to the narcotic effect of pure ether. The opening of his address showed how the inability to procure ether from Germany, from which country Holland had been accustomed to draw its supplies, gave Dutch manufacturers a new keenness in the production of the drug. Consequently, when there came from England the expressions of doubt as to the efficacy of pure ether, research workers in Holland were besought by the manufacturers for guidance. Thus it was that Prof. van Leeuwen started his admirable, and, as it appears to us, well-nigh unanswerable investigation. Having first of all procured from pure ethyl alcohol the purest ether he could, which boiled at 34·6° C., and having found that this had true narcotic effect, the Professor decided that even with this specimen the narcotic qualities might be attributed to minute impurities present. He prepared, therefore, by the use of benzidene, which crystallises with ether when they are heated together and then cooled, crystals which, when heated, gave an ether of absolute purity. This drug, which had the same boiling point as his former product, proved to be a good narcotic. It was carefully tested both quantitatively and qualitatively on both animals and on man. A series of animals were rendered narcotic with it, observations

on the blood content of ether being made at various points of the narcosis up to that at which the respiratory centre failed. With regard to the effect of impurities in ether, it appeared that, in the small amounts present in ordinary good brands, these play no part in the anæsthetic action of the drug. The only reason for adding any other drug to ether is to render it stable, for pure ether, if kept exposed to light and air, becomes contaminated with peroxides. This happens with ordinary good ethers, but not with the ether of crystallisation, or with ethanesal or Cotton's ether. In the discussion which followed Prof. van Leeuwen's paper Dr. H. H. Dale expressed his concurrence with all the findings described in it, and declared that the apparently opposite conclusions arrived at by Dr. Mackenzie Wallis and Dr. Langton Hewer could only be explained by the assumption that the drug they tested was not the same drug as that tested by himself and by van Leeuwen. Consequently he invited Dr. Wallis when next he had prepared a pure ether which he found to be non-anæsthetic to allow Dr. Dale and his co-workers to have samples of it and test it in conjunction with Dr. Wallis.

MALARIA THERAPY IN GENERAL PARALYSIS OF THE INSANE.

A WARNING as to the need of caution in the experimental treatment of general paralysis by the inoculation of malaria was the subject of a considered article by Prof. P. Mühlens, of Hamburg, in the *Klinische Wochenschrift* of Dec. 24th, 1923. Indiscriminate use of this method in private practice is strongly condemned, and even in hospitals the new treatment should not be entrusted to any neurologist who has not made himself thoroughly familiar with the clinical symptoms and signs and the parasitology of malaria. Prof. Mühlens points out that the inoculations should only be carried out on individuals whose resisting powers are good and whose paralysis is not of too long duration. The earlier the treatment is started the better are the prospects of success. Before inoculation of a patient it should be ascertained that he can easily take quinine. For malaria inoculation only a pure benign tertian strain should be used, and the progress of the blood infection should be controlled by daily blood tests, in order that when necessary the infection may be checked in time. When it appears from these examinations or from the condition of the patient that the blood infection has suddenly become very severe, quinine should immediately be given. Those treated with malaria should not be allowed to leave an institution before they have been definitely free from parasites for at least three or four weeks. Most of the malaria inoculation deaths which have come to the author's knowledge concerned ill-nourished elderly paralytics, or those whose infection was not continuously and expertly controlled, or who were not early enough treated with quinine. Prof. Mühlens's warnings are based on his desire to avoid bringing into discredit a therapeutic measure which he considers the best method of treatment for general paralysis. He claims that a very high percentage of paralytics treated with malaria and relapsing fever infection have remained for years capable of work and free from relapse.

A memorandum recently issued by the Board of Control draws attention to the differences, some of them important, between the procedure adopted for carrying out the treatment in England and Wales and the procedure which has been usually recommended by the initiators of this therapeutic measure in Austria, and a plea is entered for uniformity of procedure and practice at least in all the British hospitals where trials are being arranged, in order that the merits of the treatment may receive fair consideration. It is recorded that in some instances the induced malaria in the inoculated cases in England has been of an unusually severe type accompanied by pronounced complications and with a tendency to fatality. It is hoped that a strain of parasites which is free from objection on grounds of severity will be available shortly, but in any case if the blood of all inoculated patients is examined daily the occurrence of untoward symptoms and complications may be avoided. This procedure is also required in connexion with the risk, to which Prof. Mühlens draws attention, of unwittingly conveying a mixed infection of benign and malignant parasites from donors of blood who contract their malaria in the tropics. Since it has been shown that the common malaria-carrying mosquito of England (*Anopheles maculipennis*), after sucking blood from inoculated patients, readily becomes infected and capable of spreading malaria to other patients and to the general public, it is essential to take adequate measures to avoid this risk. During the summer months (April to October inclusive) inoculated patients should be kept in a mosquito-proof ward, or under satisfactory mosquito curtains, from the onset of the malarial attacks until careful microscopical blood examination shall have proved that the blood is free from the sexual forms of the parasite. This will usually be the case about three days after commencing a proper course of quinine treatment. As to the danger of relapse it has been contended that an entire absence of relapses is a particular feature of inoculated malaria. In this country, however, what are technically known as "parasitic relapses" have been detected by examination of the blood of patients some weeks after apparent clinical recovery, and in order that these patients should not provide a potential source of spread of malaria it is recommended that blood examinations should continue until freedom from parasites has lasted at least three weeks. It is also considered necessary that, when a patient who has undergone a course of malarial attacks is discharged from the hospital, his name and home address should be notified to the medical officer of health of the district to which he is discharged. The importance of effective quinine treatment and "after-treatment" in the interests equally of the patients and of the public is emphasised.

Details of observations on the blood and cerebro-spinal fluid of 40 patients with G.P.I. treated by inoculation with malaria are recorded in our present issue by Dr. A. R. Grant and Dr. J. D. Silverston. Sixteen of the patients received in addition a course of salvarsan, after the malaria had been arrested by quinine. A decrease of the lymphocytosis and in the globulin content of the C.-S.F., and a diminution in the intensity of the W.R. occurred in nearly half the cases. The W.R. of the C.-S.F., the colloidal gamboge reaction, and the colloidal gold test were favourably influenced at a somewhat later period in a smaller number of cases. The observers are content to record their findings at this stage without comment.

A NEW SERIES OF MEDICAL FACSIMILES.

AN interesting experiment has been made in medical publication by the Oxford University Press acting in conjunction with Messrs. Lier and Co., of Milan. They have produced[1] in photographic facsimile the excessively rare and finely illustrated folio first edition of the "Fasciculus Medicinæ" of Johannes de Ketham, printed at Venice in 1491. This edition, which had a larger page than any of the subsequent issues, is historically important as representing the turning-point for medicine from the Middle Ages to modern times. Beside the facsimile of a remarkable work the volume before us contains also an elaborate account of its sources and affinities, written by Prof. Karl Sudhoff, of Leipzig, and adapted for English readers by Dr. Charles Singer. Of the series of 14

[1] Edition de Luxe, bound in half leather with eight plates coloured by hand, £3 10s. A cheaper edition at £2 6s. identical with the first save that only one plate is coloured and the binding is half linen. The actual printing and publication is the work of Messrs. Lier, of Milan, for whom the Oxford University Press are acting in this country.

plates drawn from manuscript material, eight have been coloured by hand. Should this beautiful issue of a remarkable work prove successful, the proposal is to produce a whole series of facsimiles of early medical works. The second edition of the "Fasciculus," printed in Venice in 1493, with its woodcuts by the artist of the famous "Hypnerotomachia Poliphili," has been for some time in the press under the editorship of Dr. Singer. The ten earliest fifteenth century tractates on syphilis are almost ready and other volumes have been planned. The series, which is entitled "Monumenta Medica," is under the general editorship of Dr. Henry Sigerist, of Zurich.

HOLES IN A DETACHED RETINA.

THIS is a condition more often talked about than seen ophthalmoscopically, and when seen has generally been regarded as merely an interesting phenomenon without special clinical significance. A paper in the January number of the *British Journal of Ophthalmology*, by Sir William Lister, contains generalisations which will clear up a number of perplexities in connexion with this condition. The first is that sudden detachment of the retina cannot occur without a hole, a fact first mentioned by Leber in his lectures at Heidelberg in 1882, of which, according to Lister, too little notice has been taken. If we come to think of it, however, the onset of any detachment of the retina without a hole must necessarily be gradual. Transfer of fluid from the vitreous chamber into the inter-retinal space cannot be sudden unless there is a hole. Should there be a hole transfer must be rapid and loss of vision correspondingly sudden. If, therefore, it can be substantiated that the loss of sight from a detachment was not merely suddenly detected, but actually occurred suddenly, we can definitely predict the presence of a hole, whether or not it can be seen by the ophthalmoscope. A second important generalisation is that no cases of detachment of the retina due to neoplasm, when examined pathologically, have been found associated with a hole in the retina. In these cases the detachment is secondary, and due to the exudation of an albuminous fluid quite different from the vitreous, which in cases where a hole is present naturally finds its way through it to the inter-retinal space. We may therefore safely assume that in any case of detachment where a hole is seen by the ophthalmoscope, the presence of an intra-ocular tumour can be excluded. A third point of clinical importance discussed by Sir William Lister is the value of treatment of detachment of a retina in which there is a hole. In any case of detachment treatment is most uncertain in its results. There are few ophthalmic surgeons who could not count all the cases of undoubted cure coming within their experience on the fingers of one hand. Yet, when treatment is successful, the boon to the patient is inestimable. On the other hand, if treatment is attempted at all it is of necessity very irksome to the patient and may involve a waste of valuable time for no good purpose. Therefore the value of Sir William Lister's experience on this subject is considerable. Where the retina is being dragged in by vitreous bands, treatment, or at any rate, any ordinary treatment, is valueless, for even if apparently successful for a time, the condition is certain to recur. When, however, the retina is being pushed in by fluid poured out from the choroid into the inter-retinal space, owing to some low form of inflammation, treatment may be legitimately tried and in rare cases may be successful. Operative treatment in the presence of a hole must necessarily be unavailing, except in the rare cases of peripheral and strictly localised detachment where the affected portion of retina is completely cut off from the rest by adhesions. It is true that some years ago a committee of the Ophthalmological Society [1] reported that among cases of cure investigated there were three (apparently not as the result of operation) in which tears of the retina had been present, and it is difficult to reconcile this with Sir William Lister's generalisation. This aspect of the subject might claim attention from those who have studied detached retina in the past.

[1] Trans. Ophth. Soc., 1916, xxxvi., 354.

XANTHOMA DIABETICORUM.

ACCORDING to Dr. Ralph H. Major,[1] of the Department of Internal Medicine, University of Kansas School of Medicine, who has collected 74 cases from the literature, as well as three under his own observation, xanthoma diabeticorum was first described by Addison and Gull in the Guy's Hospital Reports in 1850. The condition is most frequent in the male sex, and comparatively uncommon in women, among whom only about ten cases have been recorded. As a rule, it disappears with improvement in the diabetes, although some exceptions have been noted, in which the skin lesions remained stationary or actually increased, in spite of the urine being free from sugar. Bristowe, who reported the second case on record in 1866, described the lesions as showing microscopically a dense fibrillated texture, studded more or less with oil globules of different sizes. Comparatively few observations have been published upon the appearance of the blood or upon the blood chemistry of these cases. Dr. Major's cases, therefore, are of special interest, in that studies were made of the blood-sugar and cholesterol, particularly in relation to treatment by insulin. The first patient was a Jew, aged 43, with a very profuse eruption of xanthoma, who was admitted to hospital with diabetic coma and died a few hours after admission. The blood serum was milky-white and presented a gross lipæmia, and the cholesterol in the blood-plasma was 432 mg. per 100 c.cm. In the other two cases the xanthoma cleared up under the influence of two factors—viz., (1) the disappearance of lipæmia and hypercholesterinæmia as the result of insulin treatment, and (2) the presence of a food supply to the lesions afforded by local injection of a small quantity of ether. Histological examination of excised nodules in the two cases showed a marked fibrosis with infiltration of small mononuclear leucocytes, the xanthoma cells being inconspicuous. A study of sections of the tissue indicated that the xanthomatous nodules were composed of neutral fat, fatty acids, and lipoid bodies, and contained cholesterol.

[1] Johns Hopkins Hospital Bulletin, January, 1924.

AT a meeting of the governors of St. George's Hospital on Monday last H.R.H. Prince George was elected President of the hospital, a post which has been vacant for nine or ten years, having been last held by Princess Christian.

WE regret to announce the sudden death on March 9th of Mr. George Palmerston Newbolt, senior surgeon, Royal Southern Hospital, Liverpool, and newly appointed President of the Liverpool Medical Institution.

MANY of our readers will have seen with lively concern the news that Sir StClair Thomson was among those injured in the accident to the Ventimiglia express near Lyons on March 10th. We are happy to be able to reassure them that his injuries were slight and that he hopes shortly to resume his journey to the Riviera.

UNDER a scheme arranged by the University of London for the exchange of lecturers between England and Holland, Dr. E. Gorter, professor of pædiatry in the University of Leiden, will deliver a lecture to advanced students of pædiatry at the Hospital for Sick Children, Great Ormond-street, W.C. 1, on March 19th at 5 P.M. The subject is the Pathogenesis of Certain Nutritional Disorders, and the lecture will be given in English, illustrated by lantern slides.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXII.

MASTURBATION IN YOUNG CHILDREN.

MASTURBATION in infants and young children is probably more common than is generally supposed. It begins sometimes as early as the sixth month, more often during the second year. Thereafter we may meet with it at any time up to or beyond puberty. Treatment will here be considered only of cases in children under 7 years.

The act is performed in various ways—by friction between the adducted thighs, by direct manipulation, or by pressing against the projecting edge of some object such as a chair or table. If thwarted in the attempt, the child may show great restlessness and irritability. If the act is completed, excitement and flushing of the face give way to a strange, drowsy state, with an expression on the child's face which shocks and alarms the mother. It is not easy in such a case to give effective treatment, and yet we may be certain that here, as in enuresis and many other functional nervous disturbances in children, treatment lightly embarked upon which fails of its effect, does more than fail. For failure of treatment which concentrates the child's attention upon the objectionable habit, thereby greatly increases the difficulty of securing ultimate success.

I think it may be best to discuss the subject of treatment under the following heads: (1) The explanation to be given to the mother; (2) the attitude to be adopted to the child; (3) apparatus for restraint; (4) the control of local irritation; (5) the prescription of sedatives.

1. *The Explanation to be Given to the Mother.*

Generally we find that the mother is in a state of extreme distress. The action of the child appears to her sinful, alarming, or altogether horrible. She is conscious of her powerlessness to forbid or to control. In all other matters the child may be docile, affectionate, and responsive to the mother's influence. But on this point the mother has, as it were, lost her nerve, and the child feels the sense of unrest. I have known a little girl compelled to give way to the impulse turn to her mother, and then, conscious of the look of unhappiness, wail out, "Smile, Mummy." The mother's power to control is inhibited because she regards the habit as showing a precocious and unnatural sexuality. It is well to begin by explaining the extreme frequency of masturbation and its comparative harmlessness. Symptoms of exhaustion occur only when the act is performed almost incessantly during day and night. Children have no knowledge of all that sex implies to the mother's mind. They will admit to the practice openly and without shame or embarrassment. They will say that it gives them a comfortable feeling. The infant before the intellectual life awakens, before recollection of yesterday's happenings and anticipation of to-morrow's is possible, is prone to solace its moments of vacancy by stimulating certain sensory nerve-endings. One baby will suck its thumbs, another will bang the occiput from side to side on the pillow, another will practise air-swallowing, or the still more difficult art of rumination. As the level of the intellectual pleasures rises these lower physical stimuli tend to lose their appeal. In general, they are kept in being only when persistent efforts are made to forbid and to thwart. Reiterated appeals and apparatus of restraint have the disadvantage that they keep the desire in the forefront of consciousness. Relief from the impulse only comes when the mind is otherwise occupied. Masturbation, the mother should realise, is comparable to head-banging or thumb-sucking. The child has lit upon this particular form of sensory stimulation, and until made aware of the curious stir among grown-up people to which this particular act gives rise, it is practised openly and without shame. The first essential for cure is to banish from the mother's mind the conviction that the child is displaying vicious and criminal propensities which foreshadow a life of sexual excesses and sexual perversions. If she can take a reasonable view of the trouble, we have then made an ally of the strongest force in the child's life.

2. *The Attitude to be Adopted to the Child.*

I believe that, in general, the best attitude to adopt to the practice is that it is a deplorable breach of manners, a disgusting habit like spitting or picking the nose. It is right that we should endeavour to provoke in the child a sensitive æsthetic sense which is altogether offended by the act. The faces around the child may show a proper proportion of disgust. But we must be careful to hide that we are alarmed or disquieted by the act or utterly cast down by it. Reiterated appeals to a child to desist from a practice which is causing grief to everyone, nightly repeated urgings to show strength and self-control, are useless. I think we can take it for granted that a little child is not likely to show sufficient self-control to resist successfully once the mind is directed towards the thought. Punishment with little children has no part to play in the treatment. It is ineffective as a deterrent, and carries with it the drawback that the children will be tempted to lie to avoid it. If the child is frank and open about the failing, treatment is rendered easier and much is gained. If the act is practised furtively and in fear, it is more difficult to eradicate because, however hard the parents may play the detective, they can never be sure of their ground and must always be in doubt as to the measure of their success. It is as unwise to show anger as it is to show alarm. As with their elders in similar predicament, the best means of defence is flight to other thoughts and occupations. Change of scene and new and suitable companionship are often at once successful in diverting the child from exclusive concentration upon the ever-present temptation. Separation from a mother whose influence cannot be utilised for good may be necessary. Someone who can make the child's life full, busy, and absorbingly interesting, is sure to succeed.

3. *Apparatus for Restraint.*

It is not often, if we have to deal with parents who can carry out a plan such as is suggested above, that we shall fail to get the child's mind diverted from the obsession. The cure of masturbation in the child is to a great extent dependent upon our power to control the atmosphere in the home. Apparatus for restraint need, and I think should, only be used when that control is clearly impossible of achievement. The particular form of restraint, of course, must depend upon the method by which the act is carried out. If the thighs are rubbed together at night or when lying down, it will be enough to adopt any apparatus which prevents the movement—for example, bracelets of webbing, worn above the knees and carrying between them a bar of light metal or wood. If it is practised by manipulation, the hands must be restrained. At the worst, confinement in poroplastic or plaster, such as is worn for spinal caries or poliomyelitis, may be necessary. But whatever device is adopted which mechanically prevents the act, I believe it is of the first importance for success that the child should in no way connect the apparatus with its real object. I believe it is worth while taking endless trouble to convince a little child that his legs are so crooked or his back so one-sided that the apparatus has to be worn to correct the deformity. The desire only passes when the child has forgotten all about it. If the apparatus serves only as a reminder of past excesses, and a prison from which he is powerless to escape in order to indulge once more, then the final removal of the restraint is quite likely to be followed by a giving way all the greater because of the long repression. All the interest and attention

may be concentrated upon the imaginary weakness, while the real enemy sinks out of sight. In young children, with the cessation of the act for some months, the likelihood of relapse is small unless the memory of it has been kept alive by the consciousness of restraint and the daily repeated efforts to prevent. In this connexion I have had one interesting and instructive experience. Almost the worse case I have encountered completely ceased during and after operation for a severe attack of appendicitis. The interest was focused elsewhere. On the other hand, the operation for circumcision, often recommended, has the disadvantage that it directs attention to the sex organs. The operation is not of itself in any way preventive or curative, and should, I think, be avoided when possible. It should be performed only if there is much local irritation under the prepuce, and other means to allay it are unsuccessful.

4. The Control of Local Irritation.

I think that the part played by local irritation in keeping up masturbation is slight. It is true that in the past the original act may have been determined by some irritation of prepuce or vulva, but when our advice is sought that is probably ancient history. Any redness or swelling locally is usually the result and not the cause of the masturbation. With little girls especially, the mucous membrane of the vulva may be red and sore. Painting freely with a weak silver nitrate solution, 1·5 per cent., may harden and desensitise, but if this is done with a little child, it is well to make pretence of similarly painting (this time with water) of nose, mouth, ears, &c., as well if by such a plan the attention of the child can be diverted from the sexual organs exclusively. If the urine is too acid, it can be neutralised with potassium citrate 20 or 30 gr. per diem. Thread-worms should be eradicated, but I have not found them often present.

5. The Prescription of Sedatives.

Children who masturbate early are more often than not unusually quick, vital, and far advanced for their age. Often there is evidence of exhaustion and overstrain, which renders them irritable, and for the time being prone to masturbate. The nervous exhaustion is clearly as much the cause as the result of the masturbation. It is well that sleep should be deep and long. Chloral hydrate has the great advantage over potassium bromide that it acts almost at once. Five grains of chloral will generally produce sleep immediately in a child of 2 years of age, while small doses of bromide may be combined with it, in the hope that thereby a gradual quieting of the child may be produced.

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Special Articles.

THE DIFFERENTIAL DIAGNOSIS AND THE PREVENTION OF SMALL-POX.*

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THE DIFFERENTIAL DIAGNOSIS OF SMALL-POX.

WITH few exceptions, in cases in which small-pox is in question, we have to rely mainly on our personal observation of a rash which in type more or less closely resembles the rash of small-pox. In the great majority of such cases there is at the time of examination no other evidence available which is of any real value, and in making our diagnosis we are compelled to depend on our estimate of the differential value of the cutaneous signs of small-pox and on that alone.

I do not mean to suggest that no value attaches to the symptoms and signs of the onset of the disease or to the character of the pre-eruptive stage. A history of the occurrence of the classical features of the small-pox invasion may be obtained from the patient; previous cases of the disease may have occurred or one may obtain a definite history of contact with the infection. But there is no symptom or combination of symptoms in the onset of small-pox which has intrinsic value in differentiation. Their evidence is of corroborative value only in the presence of a rash which is suggestive of small-pox, and care is necessary to avoid an over-estimate of this value. The signs of previous vaccination have a very limited value as negative evidence when small-pox is in question. The tendency is to over-estimate this value. Old scars, scars which have lost all pigmentation, have no value. If recent and still active lesions of vaccinia are present, one must remember that small-pox and vaccinia may run their course together. Successful vaccination is possible as late as the last days of the period of incubation. On the other hand, there is not, I believe, any reason to doubt that a successful inoculation of vaccinia made in the presence of a doubtful rash is a sure sign that one is not dealing with small-pox.

* Read at a joint meeting of the Home Counties Branch and the Fever Hospitals Medical Service Group of the Society of Medical Officers of Health, Jan. 25th, 1924.

Types of Eruption of Small-pox.

In rare cases the lesion or lesions of inoculated small-pox may be observed at the onset of the disease, and when associated with a definite history of contact with the infection, they are naturally of the greatest assistance in diagnosis.

Small-pox is capable of producing three distinct types of eruption, erythema, purpura, and a focal lesion which is really a vesicle. The erythematous and purpuric eruptions are associated with the primary fever, the erythema more closely with the early period and the purpura with the later period of this stage of the disease, while the focal rash begins to appear towards its end. The coexistence of erythema and a purpuric rash or the imposition of purpuric lesions on an erythema during a short period of observation will suggest the possibility of the presence of small-pox. The association of an erythema in a similar way with an eruption of the focal type will very strongly suggest small-pox, and if the combination of a focal eruption with a purpuric rash occurs, then the diagnosis of small-pox is very frequently correct and the gravest suspicion is always justifiable. It is to be noted that in cases of small-pox which show the last combination particularly, the lesions of the focal rash may be very few and widely scattered and may present few or none of the classical features of the small-pox lesion. They may be flat, dull-white vesicles, oval or perhaps irregular in contour, and apparently of shallow position in the skin. The commonest form of the erythema of small-pox is associated with the mild and modified attack. It is a patchy condition, of indefinite features, varying in the size of its patches, which are irregularly distributed, tending to be evanescent and migratory and not appreciably raised above the surface. This form of the erythema appears on the face only in rare cases, and still more rarely passes further over the face than the surface of the lower jaw and the adjacent parts of the cheeks. It is usually considered that measles is the disease for which this form of the erythema is most apt to be mistaken. But mistakes in this direction do not seem to be frequent and much greater confusion occurs between measles and the early stages of severe confluent small-pox, particularly in the child. A "measles" rash which is distinctly papular may be very difficult to differentiate from small-pox, and isolation of cases of this type for observation is always justifiable.

Erythema Distinctive of Small-pox.

The negative and indefinite characters of this common form of the erythema of small-pox have

obviously little differential value in themselves. They acquire value when associated with a rash of the focal type present at the time of first observation or imposed on the erythema during an observation period of a few hours. In rare cases the erythema assumes more positive features in the disposition of the rash to the surface, in the colour and size and contour of its patches. These cases are toxic in significance and may occur in the course of outbreaks of small-pox of severe type. Large areas of a brilliant colour, almost vermilion at times, may be seen on the extensor surfaces of the larger joints, or extending along the radial surface of the lower part of the forearm and of the hand or along the corresponding surfaces of the leg and foot. These patches are usually symmetrical and may be associated with plaques of a similar character on the trunk. A well-defined margin is a frequent feature of these patches, and sometimes one may find somewhere within an erythematous area on the trunk a papular lesion with hæmorrhage within and around it. This form of the erythema is apparently distinctive of small-pox. Other rare cases occur in which with the onset of the disease the whole surface, trunk, extremities, and face, is covered by a continuous sheet of erythema. In its beginning this rash is very similar in appearance to the flush which may follow a hot bath. It is usually associated with an onset of extreme violence. It is evenly distributed and universal, and in these respects, as well as in the lack of a punctate character, it is unlike the rash of scarlet fever. The beginning of the purpuric rash of the flexures may be a simple erythema from which the colour is easily expressed.

The Purpuric Sign.

These examples of the erythema are toxic in character, and the advent of the purpuric sign is not usually long delayed. The subsequent course of such cases may be dominated by the purpuric lesions which rapidly increase in number and size while the erythema fades, leaving staining. The patient may die without any development of the focal rash. The purpuric lesions by their number and severity appear to usurp the position of the focal lesions. Or the focal rash may appear as a very discrete eruption of hæmorrhagic papules which go on to form vesicles of the type already described, having hæmorrhage within and around them. More frequently the confluence of the focal eruption causes an appearance of swelling of the skin of the face and perhaps also of the hands. The individual lesions cannot be distinguished by touch on the face and only with difficulty on the hands. The skin of the forehead is thickened and immobile and the cause of the condition may not be apparent. But the more discrete foci on the trunk and other parts in such cases are easy to recognise. In very rare cases of this type life is prolonged sufficiently to allow of confluent vesiculation to take place. Extensive tearing of the pellicle may be caused by the restless delirium of the patient, and the case may terminate with the appearance of a severe exfoliative dermatitis.

Mistakes in cases of the most severe toxic type of small-pox may arise on account of the almost complete suppression of the focal rash, or rather the replacement of that rash by purpuric lesions. But in the majority of the cases the extreme severity of the purpura, the association of erythema with purpura, or the imposition of a focal eruption, however discrete, on a severe purpuric rash should be sufficient for diagnosis. The most frequent cause of error is the concentration of the attention on the most prominent feature of the illness, the toxæmia, which is assumed to be sufficient as a diagnosis, and the disease as well as the cause of death is labelled "blood poisoning."

Not much more need be said of the purpuric sign in small-pox. The use of this term is convenient because it includes all the purpuric conditions which may occur, the hæmorrhages from mucous surfaces as well as the hæmorrhages in mucous membranes and skin. It is the sign of toxæmia and it may be found at times in cases of almost every infection. Its manifestation in the skin varies in severity from the slight staining which may be left by the fading erythema or the small bright red petechial lesions which have their site of election in the flexures of the surface to the deep-seated, massive, bruise-like hæmorrhages, and the purple, almost black blotch of a large area of more superficial extravasation. Neither in form nor in position is the sign peculiar to small-pox. The differential value in small-pox depends mainly on a greater average severity in this disease and possibly on a greater average frequency than in other infections. Of the severity of the sign in small-pox, the petechial rash of the flexures is an illustration. Similar rashes may be seen in scarlet fever and in cases of food poisoning. But in small-pox the condition is remarkable for the density of the setting of the petechiæ and also for the extent of the area involved.

A general estimate of the differential value of the sign in small-pox may be expressed in this way: Given the onset of a feverish illness which points to the presence of an acute infection and is accompanied by the purpuric sign, small-pox should be considered to occupy the first position as a possible cause of the condition, and the probability that small-pox is the cause increases with the severity of the purpuric eruption, having regard to the number of the lesions, to their type, and also to the amount of general involvement of the skin.

The Focal Rash.

Ricketts's term for the characteristic rash distinguishes it from the other types of eruption which may occur in the disease. It is a rash made up of a varying number of units or foci pathologically identical. The greater differential value may be ascribed to the features of the unit or to the features of the rash. By his investigations Ricketts showed that the features of the rash, and particularly the position of the lesion on the skin—that is, the relation of the rash to the surface of the body or the distribution of the rash—have a much greater differential value than the features of the unit.

Features of the Unit.

The life-history of the lesion is essentially the life-history of a vesicle which has its origin in a small sharply-defined inflammatory focus in the deeper layers of the epidermis. It is a process of deep-seated vesicle formation. In the typical lesion clinical evidence of the nature of this process begins to appear as soon as the papular element is recognisable. It attains its greatest prominence when vesicle formation becomes apparent. It gradually recedes from view as pustulation advances until at the end of the process, when only the crust remains, the evidence has almost completely disappeared, and the identification of the lesion depends almost entirely on its situation on the surface of the body. Appreciation of the true nature of the process, that it is a deep-seated vesicle formation, will assist in the differentiation of several conditions which are at times mistaken for small-pox, such as most cases of acne and of measles, many cases of urticaria, of secondary syphilitic eruptions, and the lesions caused by insect bites.

Value of Anatomical Evidence.

It is unnecessary for our purpose to consider in detail the clinical evidence by which the nature of the pathological process may be recognised—namely, the evidence of the depth of the focus in the papular and vesicular stages, the observation and meaning of loculation and umbilication of the vesicle, the evidence of the onset of pustulation, the features of the crust, and how they depend on the anatomical character of the skin of the part on which it is situated. The differential value of this anatomical evidence is limited. It is transient. It is based on the anatomical features of the typical lesion which are in continuous change throughout the evolution. It is also dependent on a comparison between these features and those of other focal lesions, and is therefore very subject to the influence of the personal factor of the observer. In

the abnormal lesion, produced by conditions which interfere with the regular course of the evolution, clinical evidence of the nature of the process is always partially concealed, and in extreme cases differentiation from other focal lesions may be quite impossible.

Abnormal lesions, or modified lesions, to use the term in the meaning of any clinical departure from type, may occur in old age, or as the result of long continued ill-health. In these conditions the skin shares in the general depression and may fail to react in the normal way to the presence of the inflammatory focus. The lesion in such cases is apt to be less prominent in the vesicular stage, to be flat, ill-defined, and sometimes irregular in contour. It may resemble rather closely the lesion of varicella. Lesions of similar characters may be seen in the severe toxic attack, scattered over the surface here and there amongst the much more evident purpuric lesions. The abnormal characters in these cases may be the result of the over-whelming toxæmia.

Important Abnormalities in the Lesion.

The most important abnormalities in the lesion are the result of the existence in the patient of a degree of protection, natural or acquired, against the disease. A partial immunity, to use a convenient term, has a two-fold effect on the focal rash. The decrease which it usually brings about in the number of the lesions is the less important because it involves no interference with the clinical evidence of the nature of the inflammatory process. The more important effect is the decrease in the severity of the inflammatory process, involving a general decrease in the size of the lesions, a greater variation in their size than is seen in the normal rash, and a general speeding up of the clinical changes which occur in the course of the evolution. The result is that the papule is usually smaller than the normal small-pox papule, the vesicle and pustule do not involve the whole papule, and if the immunity is of high degree, the appearance of a small crust set on the top of a hypertrophied papule, in two or three days after the beginning of the outcrop of the rash, may be the only evidence available that vesiculation and pustulation have taken place in the lesion. That is to say, the clinical evidence of the nature of the process may be almost completely destroyed. The speeding up of the changes of evolution may become evident at any stage of the process, and in some lesions a true abortion of the process from the papular stage may occur. It is true that in the majority of cases of modified small-pox a proportion of the lesions will be found to conform more closely to type, but in a rash of very low numerical value it may be impossible to find reliable evidence of a deep-seated vesicle formation in any of its lesions at any time. The most valuable differential feature of the lesion, the unit of the rash, is not found in any of its anatomical characters, but in the fact that the process of evolution, even in the normal lesion, is regular and continuous and rapid. Appearances change from day to day and almost from hour to hour in the typical lesion, and only a very short period is required to demonstrate this feature, which has the additional advantage that it is not concealed but rather emphasised by the increased speed of the evolution under the influence of a partial immunity.

Differential Value of Distribution of Small-pox Rash.

Ricketts's researches and his demonstration of the supreme differential value of the features of the small-pox distribution are founded upon two independent observations which had been made several years before he began his work.

(*a*) It had been observed that the rash of natural small-pox has a tendency to affect the face and extremities in preference to the trunk; that on the trunk it is usually more densely set on the upper than on the lower parts, tending to avoid the lower part of the abdominal wall, and particularly the groin, the site of election of the petechial lesions; also that on the extremities the rash prefers the distal to the proximal parts—that is to say, the rash of small-pox is centrifugal rather than centripetal.

(*b*) It had also been observed that the lesions of the focal rash tend to cluster on and around an area which has been subjected to pressure or to the irritation of a local application. Experiment had shown that the irritation, in order to produce this effect, must be in action before or during the incubation period, because when applied after the onset of the disease no increase in the incidence of the rash on the affected part was observed.

To the study of these "irritation patches" Ricketts applied the pathology of inflammation and formed the opinion that irritation brought about an increased incidence of the lesions on the affected part through the disturbance which it caused in the peripheral circulation of the part. It is unnecessary for our purpose further to discuss Ricketts's convincing theory of the origin of the lesion, but one may summarise the conclusions to which he was led by his observations and experiments on the quality of the "irritation" which is necessary or desirable, if one may so speak, in order that the effect on the incidence of the rash may be most obvious. This quality is not severity. Severe irritation, sufficiently severe in itself or by reason of the duration of its application, tends not to increase the incidence, but to have the opposite effect, if the disturbance of the circulation is carried beyond the earliest stages of the process of inflammation. The "irritation," which amounts to no more than a slight stimulation, of which the patient may be quite unconscious, more especially when constantly repeated with slight intermissions, produces a very obvious effect in increasing the incidence of the rash on the affected part. The disturbance brought about in the circulation may be said to amount to no more than an increase in the normal oscillation of the current through the part, and never reaches the later static phase.

If the incidence of the rash can be influenced in so marked a manner by irritation which may amount to no more than a slight stimulation, is it not possible that a similar influence may be at work in producing the well-recognised natural tendency of the lesions to select certain areas in preference to others? Are there any conditions common to those areas which are analogous to irritative conditions in their effect on the circulation? Ricketts's reply to these questions is best given in his own words: "The operative causes are manifold, but the most potent factors are exposure to air and friction with clothing, and to their efficacy every case of small-pox is a testimonial."

Results of Protection of Part from Exposure and Friction.

Ricketts completed his demonstration by showing that the actual protection of a part from exposure and friction caused a decrease in the incidence in comparison with the corresponding part which was left unprotected. He had noted in instances in which small-pox followed surgical operation on the extremities that the part of the limb which was covered by wool and bandage appeared to be less affected by the rash than the corresponding part on the other side of the body, and he demonstrated the same result by direct experiment and noted that it is necessary to apply the protection not later than the onset of the disease, in order that any result may be obtained. This conclusion corresponds to the conclusion reached by a former observer regarding the time of application of an irritant in order that an increased incidence of the rash may occur.

Therefore, the parts of the surface which by their position or by their contour are naturally protected from exposure and friction are the parts on which the incidence of the rash is less evident, and the more complete and continuous the protection is, the greater is the tendency for the rash to avoid the protected part. For example, the most constantly and completely protected parts of the surface are usually the fold of the groin and the depth of the axilla, and these are the parts which the focal rash most consistently avoids.

The distribution of the focal rash of small-pox is governed by two factors, exposure and protection. These factors are common to every member of the race. They are independent of the course of the disease, of the evolutionary changes which constitute the features of the lesion, and of the modification of these changes which is the result of a partial immunity. The features of the distribution begin to be established with the beginning of the outcrop, they are fully established when outcrop is completed, and they remain unchanged as long as the rash lasts. The natural disposition of the focal rash to the surface of the body is modified only by individual peculiarities of habit and environment, and these local modifications of incidence are not usually difficult to interpret, and are more apt to assist than to hinder the recognition of the disease.

The Significance of Variation in Type of Infection in Small-pox.

The nature of an infection which has flourished almost continuously during recent years in many parts of the country has aroused considerable discussion, and suggestions have been made that the disease differs from normal small-pox and chicken-pox to an extent sufficient to justify the belief that it is a distinct disease, perhaps intermediate in character between small-pox and chicken-pox, or perhaps a hybrid, a varioloid varicella, or that it is a fixed variant of small-pox. In support of these suggestions attention has been directed to the almost complete absence of fatality, notwithstanding a high proportion of unvaccinated individuals among the patients, and also to the occurrence in unvaccinated patients of eruptions abnormal in character and therefore suggestive of the presence of a considerable degree of protection against the disease.

There is no doubt that a number of cases have occurred, and continue to occur, in the same districts where these abnormalities have been noted, in which the course of the disease and the features of the distribution of the rash, as well as the features of the lesions in their evolution, cannot be distinguished from the conditions recognised as typical small-pox. It is to be noted also that the abnormal conditions which have been emphasised concern the less important features of the evolution of the lesion and do not refer to the more important features of the distribution of the rash. There is also no apparent doubt that the relationship between many of the cases and vaccinia is identical with the relationship between vaccinia and small-pox. The very low rate of fatality or the complete absence of fatality cannot be used as an argument against the opinion that the disease is true small-pox. Great variation in fatality-rates is a well-recognised feature of epidemics. This variation has its value in indicating variation in type of disease, but has no value in differentiating one disease from another. It has an epidemiological and not a clinical significance.

There appears to be no doubt that small-pox has existed in many parts of the country during recent years, that it continues to flourish and to spread and has now become endemic in several districts. Fortunately, it is a mild type of the infection, and only in this respect may be regarded as a variant of small-pox. Whether it is a fixed variant or may at some time assume the features of the more virulent disease is a question on which it is advisable to reserve an opinion. *(To be concluded.)*

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Inspectors of the Local Government Department.

RECENTLY, in response to demands made in the Dail, the Government made a return showing the numbers of inspectors employed by the Local Government Department in 1914, in 1920, and in 1923, with the salaries paid. Although the area under the control of the Department has been diminished by six counties since 1914, the number of inspectors has increased from 8 medical and 28 lay in 1914 to 9 medical and 29 lay last year. At present the medical inspectors are paid salaries as follows: five receive from £500 to £700 a year with bonus, one £500 with bonus, one £420 to £600 with bonus, and two £700 inclusive. Of the 29 lay inspectors no less than nine receive either as much as, or more than, the most highly-paid medical inspectors. Of these nine, six get £500 to £700 with bonus, one £700 to £800 with bonus, one £700 to £900 with bonus, and one £1000 with bonus. It is not easy to see why the lay inspectors should be more highly paid than the medical. A medical inspector has undergone a long and arduous training before qualification, and has probably spent several years in the practice of his profession before being appointed to an inspectorship. A professional inspector should, therefore, receive higher remuneration than another. Some of the inspectors classed as lay are, no doubt, engineers, and therefore entitled to whatever advantages a professional status brings with it, but there seems to be no reason why engineering inspectors should be better paid than their medical colleagues.

The Free State Army Medical Service.

Major-General F. Morrin, who succeeded Major-General Hayes nearly a year ago as head of the Medical Service of the Free State Army, has now retired. General Morrin, who had previously served in the Royal Army Medical Corps, has been in the Medical Service of the Free State Army since it was founded nearly two years ago, and until his appointment last April as Director of the Service he was operating surgeon at the Curragh. He now returns to civil life and to his duties as one of the assistant surgeons to St. Vincent's Hospital. He was entertained to dinner last week, on his retirement, by the officers of the Medical Service, who made him a presentation in token of their appreciation of his conduct as head of the Service. In addition to the medical officers present, General Mulcahy (Minister of Defence), General M'Mahon (Chief of Staff), General O'Sullivan (Adjutant-General), and other officers holding high command attended and took part in the proceedings. The country is much in debt to both General Hayes and General Morrin for the work they have done for the Army under great difficulties and to the sacrifice of their private interests. The new head of the Medical Service is Colonel T. Higgins, who has been in the Service since its foundation, and previously served in the Royal Army Medical Corps.

University of Dublin.

The Senate of the University of Dublin has approved for the Honorary Degree of Doctor in Medicine the name of Surgeon Vice-Admiral Joseph Chambers, Medical Director-General of the British Navy. Admiral Chambers is a graduate of Dublin, and the first of that University to reach the highest medical post in the Navy. The Royal College of Physicians of Ireland recently elected him to an Honorary Fellowship.

RETIREMENT OF PROF. HILL ABRAM. — Prof. John Hill Abram, who for over 40 years has been connected with the Medical School of the University of Liverpool as student, lecturer, and professor, has just retired from the Chair of Medicine which he has held for the last two years. Prof. Abram has also given up his appointment on the staff of the Royal Infirmary, where for over 20 years he has been senior honorary physician. He will, however, continue in private practice. During his long association with the Medical School, Prof. Abram has been successively medical registrar, lecturer on pathology and clinical medicine, professor of therapeutics for 14 years, and he was appointed professor of medicine in 1922. On March 7th the students presented him in the Surgery Theatre of the University with a water-colour as a token of their appreciation, admiration, and affection. A humorous touch was added to the proceedings, when in addition to the picture there was handed to the professor a rather forbidding birch rod, which was described as "The Insignia of the Order of the Birch, presented for conspicuous merit in the application of the Art over an extensive period."

Correspondence.

"Audi alteram partem."

PREPARING HANDS AND GLOVES FOR OPERATION.

To the Editor of THE LANCET.

SIR,—Both Dr. G. W. Theobald and I wish to thank you for the kind and also amusing leading article which you devoted to our communication in the last issue of THE LANCET. We feel, however, that some of your criticisms should be answered, but since these were directed chiefly to the question of the bacteriological technique involved I, as the one responsible for that technique, am replying.

You state: "It is an essential part of the method that some reliance is placed on antiseptics and in particular on 1/1000 biniodide of mercury." What you were good enough to publish was merely an abstract, but in the complete communication Dr. Theobald dealt with the question of the antiseptic, pointed out that any disinfectant in any strength might be employed, and suggested that, if desired, concentrated sulphuric acid might be used. Even if your criticism of 1/1000 biniodide was entirely justified the method can still stand, as the use of biniodide 1/1000 is in no way fundamental. That solution was adopted chiefly because it was the one previously in common use for the preparation of hands in the Rotunda Hospital.

Again you state: "We must for the present feel a certain hesitation in accepting, sine grano salis, the statement made that gloves infected with virulent pus can be sterilised by mechanical washing and the use of dilute antiseptics." May I venture to offer the necessary grain of salt in the hope that it will make our contention sufficiently palatable for you to swallow? In one case a glove was contaminated with pus, blood, fæces, &c.; in the other it was covered with a culture of *B. coli*, which culture was made in a medium containing equal parts of broth and hydrocele fluid. In the second case the glove was dried before it was treated by Dr. Theobald's method, and it is believed that the conditions obtaining on it were exactly comparable to those on a glove contaminated with pus and other body fluids and then allowed to dry. When examined the gloves appeared to be sterile. This could only have been due to one or other of two things:—

1. All the bacteria had been removed or destroyed and the gloves were sterile.

2. An error had been made; the bacteria were still present and living but could not grow.

You appear to incline to the second view and in support of it you say: "Now, recent work has shown that, in general, mercurial solutions merely prevent growth and do not destroy bacteria," and you suggest that sodium thiosulphate should have been used to render inert any biniodide remaining. I am well aware, as is every bacteriologist who has performed tests of the germicidal power of disinfectants, of the danger of confusing inhibition of growth with actual destruction of bacteria. So far is this from being recent that it was realised many years ago when the "thread" method of testing germicidal power was in use, for ammonium sulphide or hydrogen sulphide was employed to render inert all traces of mercurial antiseptics before cultures were made. Such precautions were not considered necessary in our experiments because the gloves after treatment with biniodide were held under a stream of sterile water to remove all traces of that substance. I regret that this was not stated in our abstract, but our consideration for your valuable space led us to omit much which we should have liked to include. Supposing, however, that the disinfectant had not been removed, what would have been the concentration of biniodide in the cultures? It is just conceivable that as much as 0·5 c.cm. of the 1/1000 biniodide might remain on the glove if the washing had been omitted. This would be diluted 1/20 in saline and of this dilution 1·0 c.cm. would be added to about 15 c.cm. of agar. In the agar culture, therefore, the concentration of biniodide would be—$1/20 \times 1/15 \times 1/1000 = 1/300{,}000$. In the experiments made on the hands in gloves containing biniodide solution, the precaution of washing the hands before examination was not taken and yet, in one case, where the examined hand was tested while still wet with what had, originally at least, been 1/1000 biniodide, 14,700 bacteria were found to be present.

I realise that the question of inhibition is serious, and when I read your leader it struck me, as at least possible, that you were right and I was wrong. Since mere opinion must give place to definite evidence, I performed an experiment on Saturday to discover what concentration of biniodide would have an inhibiting effect under conditions similar to those prevailing in my tests. Various dilutions of biniodide in water were made and amounts of these were added to tubes of agar melted and cooled to 50° C., so as to give a series of tubes of agar containing biniodide in concentrations ranging from 1/10,000 to 1/500,000; two additional tubes received a similar amount of sterile water to act as controls. Two laboratory (not social) hands were scrubbed in sterile saline (20 c.cm.) and plates were made from the series of agar tubes, 1·0 c.cm. of the washings being added to each. To-day I have counted the colonies in the plates and the results are as follows:—

Agar with—	Colonies.	Agar with—	Colonies.
1/10,000 biniodide	0	1/250,000 biniodide	2330
1/25,000 ,,	0	1/300,000 ,,	2900
1/50,000 ,,	0	1/400,000 ,,	2680
1/75,000 ,,	0	1/500,000 ,,	2220
1/100,000 ,,	0	Agar without biniodide	2780
1/150,000 ,,	0	,, ,, ,,	2490
1/200,000 ,,	2180		

Despite the fact that the hands of the laboratory worker examined were too heavily contaminated with bacteria to give quite satisfactory plates, it is clear that under the conditions of my original tests, a smaller concentration of biniodide than 1/200,000 does not cause any serious inhibition of growth, and I claim that the method of testing employed was valid and, as a natural conclusion, that Dr. Theobald is justified in his contention that his treatment does sterilise "gloves infected with virulent pus." The bacteria were either removed or destroyed, and not merely anæsthetised.

I apologise for the length of this letter, but feared that condensation might only lead to further misinterpretation.—I am, Sir, yours faithfully,

JOSEPH W. BIGGER.

School of Pathology, Trinity College, Dublin, March 10th.

PETROL FOR SURGICAL SKIN TOILETTE.

To the Editor of THE LANCET.

SIR,—May I through your columns call attention to the use of petrol as an efficient substitute for ether in cleansing the skin for operation purposes? I have used this substance for this purpose for over 12 years with entirely satisfactory results. While at home recently I found that ether soap was the material used for this purpose at my old hospital (the London) and no doubt at other hospitals in the Kingdom. The amount of money annually expended in this way must be very great. I take absorbent cotton-wool as it comes from the manufacturer, wet it with petrol and scrub the skin with successive swabs until they come off clean. I then paint the skin with tr. iodi made from methylated spirit and cover with a sterilised towel. This is done the night before and repeated again on the operating table. I find that petrol is quite as efficient as ether in the extraction of fat and dirt from the skin, thus allowing the iodine to penetrate. I use ordinary petrol and my results are quite as good as they were in the days when I used ether soap.—I am, Sir, yours faithfully,

F. J. W. PORTER,
Major, R.A.M.C. (retd.)

Surgical Nursing Home, Bombay, Feb. 12th, 1924.

TESTS FOR CURE OF GONORRHŒA IN WOMEN.

To the Editor of THE LANCET.

SIR,—In your issue of March 1st Mr. J. J. Abraham rates the value of cultures in the examination of women with gonorrhœa so low as "useless" when compared with films. His experiences, however, are somewhat unusual. Using hydrocele agar or serum agar, overgrowth by other organisms is seldom of consequence in the female, and, as is to be expected, more "positives" are obtained by culture than by film :—

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Furthermore, the culture method is safer, because the worker has both morphological *and* cultural characters to aid him. Indeed, the value of cultures over films in women is considered so marked here that, by arrangement with Mr. Hugh Lett and Dr. A. M. Simpson, routine films have been dispensed with, and cultures are taken by the staff in the women's clinic.—We are, Sir, yours faithfully,

PAUL FILDES.
London Hospital, E., March 6th, 1924. G. T. WESTERN.

CERTIFICATES OF INSANITY.

To the Editor of THE LANCET.

SIR,—I trust that you will lend your influential aid in endeavouring to relieve the profession from the risks that it unnecessarily runs in signing the present certificates of insanity. The legislature demands that a person suffering from dangerous insanity should be deprived of his liberty, and it is the duty of the legislature to provide that the detention is necessary and right. A non-official general practitioner is not the servant of the legislature, and should therefore not be required to take any responsible part in carrying out its objects; his duty only consists in advising the treatment necessary. If he voluntarily undertakes to aid the legislature by giving an opinion, with the facts on which that opinion is based, he should not be held responsible for the action that the legislature takes upon that opinion and testimony, and the certificate should be framed in accordance with this principle.

I therefore suggest that after paragraph 5 in the medical certificate of insanity form some addition should be made to the effect that, since the facts stated may reveal secrets obtained professionally, the certificate should be regarded as privileged and should not be revealed, in any way that could lead to the injury of the signer, legally or otherwise. I suggest that the whole profession should unite to obtain this protection from the legislature, or alternatively decline to sign certificates in the present form.

I am, Sir, yours faithfully,
March 5th, 1924. H. RAYNER.

CHOLESTEROL AND TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—I am anxious to know whether any serious trial has been made of cholesterol as a therapeutic adjuvant in cases of tuberculosis, especially pulmonary tuberculosis—either by methodically increasing the cholesterol-intake in the diet or by other medicinal methods. In the careful résumé of hitherto tried treatment given by Dr. R. A. Young in his second Lettsomian lecture, on March 5th, no mention of cholesterol was made. Perhaps readers of THE LANCET can inform me on the subject. A high cholesterol-content in the blood is supposed by some to indicate good resistance towards bacterial infections, and it is remarkable that in diseases often associated with hypercholesterinæmia—gout, arterial atheroma, arteriosclerosis, chronic interstitial nephritis, and chronic cholelithiasis—there seems to be considerable antagonism towards acute pulmonary tuberculosis. Diabetes mellitus, though often associated with hypercholesterinæmia, should be placed on one side, as apparently the hyperglycæmia and wasting favour pulmonary tuberculosis. It would also be interesting to know whether methodical reduction of the cholesterol in-take in the diet can diminish the liability to arterial atheroma, &c. The experimental production of aortic atheroma in rabbits by cholesterol-feeding can hardly be taken as strong evidence, since rabbits are peculiarly liable to atheroma.

I am, Sir, yours faithfully,
London, W., March 6th, 1924. F. PARKES WEBER.

INHALATION IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

To the Editor of THE LANCET.

SIR,—In his second Lettsomian lecture on the treatment of pulmonary tuberculosis, reported in your last issue, Dr. R. A. Young has given a place to inhalations in his survey of various methods of treatment. I have been using inhalation in conjunction with sanatorium treatment for the last 25 years with considerable benefit. The mixture I am in favour of is one containing guaiacol, terebene, menthol, ol. pin. pumil., chloroform, and rectified spirit with or without tinct. iodine or formalin (2½ to 5 per cent.), which is manufactured by Oppenheimer, Son, and Co., London. The inhalation relieves the patient's cough, determines more blood to his lungs like Kuhn's mask, protects him from strong winds and dust, and prevents any infectious cold or catarrh of the nose and throat from spreading downwards and starting fresh mischief in the lungs, and thus in many ways it helps to arrest the disease. Its results are striking when it is used continuously and perseveringly.

I am, Sir, yours faithfully,
Mendip Hills Sanatorium, March 10th, 1924. C. MUTHU.

THE POSITION OF NON-PANEL PRACTICE.

To the Editor of THE LANCET.

SIR,—The National Medical Union of Non-panel Medical Practitioners is accumulating evidence to lay before the approaching Royal Commission. As the whole system of panel medical practice is to come under review, it is very important that the non-panel case should be adequately presented.

With a view to assisting the Royal Commission to come to a clear decision on the merits of the Medical Benefit Section of the National Health Insurance Acts, all insured persons are requested earnestly to reply to the two following questions :—

A. Are you satisfied with the present panel medical system ?

Answer .....

B. If not, would you prefer to make your own arrangements for medical attendance, receiving when sick a certain amount of money towards your medical expenses, and consulting the doctor of your choice ?

Answer .....

I am, Sir, yours faithfully,
E. H. WORTH, M.R.C.S.
(for the Hon. Secs., N.M.U.).
11, Chandos-street, Cavendish-square, W., March 5th.

STAPLE HOLDERS FOR ROUX'S OPERATION.

To the Editor of THE LANCET.

SIR,—In your issue for March 1st (p. 465) Mr. C. M. Page's staple holder is shown. I was not aware of his invention, which resembles in idea my own. Mr. Page's staple holder is for the Roux staple, and unless altered it would be useless to take the Jacöel. I think the advantage of my staple holder over that of Mr. Page is that the sides of the staple are in no way obscured by the holder.

I am, Sir, yours faithfully,
Glasgow, March 5th, 1924. A. MACLENNAN.

A "GRADED FACTORY" FOR TUBERCULOUS PATIENTS AND EX-PATIENTS.

To the Editor of THE LANCET.

SIR,—I have had my attention drawn to a statement I made in my article with this title. I wrote: "Some sanatoria are self-supporting and even make a profit." I should be glad to correct this statement so that it may run: "Some sanatoria are maintained well under their estimates and thereby have a good balance in hand."

I am, Sir, yours faithfully,

CHARLES F. PEDLEY.

Winsley Sanatorium, nr. Bath, March 3rd, 1924.

POST-OPERATIVE INSANITY.

To the Editor of THE LANCET.

SIR,—The case described by Dr. A. J. Cokkinis in your issue of March 8th is of great interest. His suggestion that his patient's unfortunate condition is due to minute focal hæmorrhages or thromboses destroying certain association fibres in the silent areas of the brain is probably the correct solution. At the same time it is doubtful whether a resection of the nasal septum is justifiable in elderly patients, save, possibly, under exceptional circumstances. In the majority of persons over fifty I am always chary of advising such operations. An experience of over a thousand has taught me that the rapidity of recovery varies in direct proportion with the age of the patient.

I am, Sir, yours faithfully,

MACLEOD YEARSLEY.

Wimpole-street, W., March 8th, 1924.

ITALIAN LABELS ON PROPRIETARY MEDICINES.

To the Editor of THE LANCET.

SIR,—Our attention has been called to an article entitled, Secret Remedies: Formulas Disclosed by the Makers, published in your issue of Feb. 2nd. These formulas have apparently been obtained from Italian sources. Among them is found one for "Collis Browne's Chlorodyne." As the headlines and the introductory paragraph of your article suggest that these formulas are given by the makers themselves, we beg to inform you that we have never "disclosed" our formula.

From a recent experience of our own we are led to suggest that you have been misled. An order for Dr. J. Collis Browne's Chlorodyne was placed with us by an Italian firm. Accompanying it came a parcel of small labels bearing a formula which the firm requested us to attach to our bottles. We refused. Surprise was then expressed at our refusal "*as the formula-label was only required for preferential Customs Tariff purposes.*" We send a specimen for your information. You will note that it is different again from the one which you publish.

> Cloroformio Puro 6.00, Est. Liquorizia Acquoso 12.00, Cloridrato di Morfina 0.15, Essenza di Menta 0.10, Miele depurato 25.00, Sciroppo Semplice q. b. per fare 100.00.

It is evident that certain Italians must be affixing anything they like to proprietaries imported into or sold in Italy by them without consulting the makers.

We are, Sir, yours faithfully,

J. T. DAVENPORT, LTD.

London, March 10th, 1924.

THE PEOPLE'S LEAGUE OF HEALTH.—Prof. J. C. Drummond will deliver the fifth lecture of the Sims Woodhead series of Constructive Educational Health lectures, which the People's League of Health is giving at the Medical Society of London, 11, Chandos-street, Cavendish-square, W. 1, on March 10th, at 6 P.M., the subject being Food. Further particulars can be obtained from Miss Olga Nethersole, the People's League of Health, 12, Stratford-place, W. 1.

Obituary.

ANN ELIZABETH CLARK, M.D.BERNE, M.R.C.P.I.

THE death of Dr. Annie Clark on Feb. 25th in her eightieth year removes one of the few remaining pioneers of women in medicine. Her death occurred at Street, Somerset, whither she had returned on retiring from active practice in 1914.

Ann Elizabeth Clark was born at Street in September, 1844, the seventh of the 14 children of James and Eleanor Clark (née Stephens). Privately educated at Laura-place, Bath, it was not until late in her twenties that she began to study for university entrance. Joining Sophia Jex-Blake, Agnes McLaren, and Edith Pechey at Edinburgh, she moved to London in 1874 when women students were excluded

DR. ANNIE CLARK.

from Edinburgh, and obtained a medical degree in 1877 after two years' study at Berne, where Theodore Kocher was a good friend to her. A year later the Royal College of Physicians of Ireland admitted her as a licentiate, and after further study in Paris, Vienna, and Boston, she went to Birmingham in 1878 as resident medical officer to the Midland Hospital for Women, later becoming the first woman on its honorary staff. She was also for more than 20 years on the staff of the Children's Hospital.

In Birmingham Dr. Annie Clark soon built up a large private practice, notably among poor people. Not richly endowed with the gifts and graces which make it easy to gain popularity in social life, she had a sure instinct for what was possible and practicable in any given household. "She always seemed to know exactly what to do," her patients said of her, and she was sometimes criticised for allowing herself to become exhausted through sympathy for those to whom she ministered. At the Women's Hospital she was associated in succession with Mr. Lawson Tait, Mr. J. W. Taylor, and Mr. Frederick Edge—not having the F.R.C.S. she did not operate herself in the hospital—and the last-named writes thus of her:—

> "For anyone who had not worked with Dr. Annie Clark it would be difficult to believe that such a quiet little oldish woman doctor could have had the strong kindly influence over her colleagues which she always exerted. There were

men of strong character about her and working with her, but it is no exaggeration to state that not one of her colleagues influenced the tone and standard of the hospital more than she did. In life it comes as a revelation to see how much a noble mind, conscious of right, can effect, and how little it counts whether that mind be in a body of slight form or in a massive frame. In this instance we had a gentle, retiring woman with a great tolerant understanding, beloved by all who knew her. Whatever happened in the way of blunder, or neglect, or unworthy practice, meriting and perhaps receiving blame from others, nothing but sympathy and wise counsel came from her. At a time when there was among medical men much suspicion and some mild fear of medical women, which to some slight degree may have been justified by the advertisement and publicity given by the lay press to anything connected with women entering the profession, it was like a soothing balsam to know and work with this fine example of what a medical woman could be."

As one of the senior members on the staff of the Children's Hospital she was ever ready to discuss new methods and ideas with her juniors, seeking how to bring the results of investigations, which they had more time than she to carry out, to the service of the patients. One of the juniors writes of her aptitude for seeing the practical bearing of pathology and bacteriology in her ward work, adding: "Dr. Clark was ready generously to acknowledge any assistance thus given her by even the youngest member of the staff. There was a quiet happiness about her that won the regard of those associated with her." Her habit of speaking the truth without evasion was carried far beyond what is usual in every-day life. If a patient asked a question to which the answer was painful she believed it right always to tell the truth, holding that the sick person had a right to this straight dealing. From the first she refused to order alcohol for her patients. She demanded the best of people on account of believing the best of them. Her patients had a sense of her devotion to their interests, and when she left Birmingham they raised a sum of £750 to endow a bed at the home for cancer cases started by her and a few colleagues.

After retiring to Street, where she lived with a younger sister, Dr. Annie Clark was able to enjoy more fully her absorbing hobbies of travel, botany, and archæology. Her advice was still available at the local baby clinic, and she acted for some time as hon. secretary of the Belgian Committee. As she became physically more invalid her interest in life never flagged. Her last illness was of only a week's duration. Her body was cremated at Birmingham on Feb. 29th, and the ashes laid in the Friends' Burial Ground at Street.

HENRY ALEXIS THOMSON, F.R.C.S. ED. & ENG.

BY the death of Emeritus Prof. Alexis Thomson at Algeciras in his sixty-first year, on March 4th, there passes from the Edinburgh Medical School one of its most prominent and popular figures. Last October Prof. Thomson formally retired from the chair of systematic surgery in Edinburgh University, which he had held for the past 14 years, as ill-health prohibited further professional duties.

Prof. Thomson, one of the seven sons of an eminent Edinburgh business man, was born in Edinburgh in 1863, and passed his schooldays at the Royal High School there. Before taking up the study of medicine he spent two years at the Realhochschule of Hanover, and in France, where he acquired an intimate knowledge of French and German. At the University of Edinburgh he distinguished himself among his fellow medical students, gaining medals in both systematic and clinical surgery, and graduating with honours in 1885 at the age of 22. In the same year he became a Member of the Royal College of Surgeons of England, of which body, many years later, he was elected a Fellow.

After graduation he acted as house surgeon in the Sick Children's Hospital and in the Royal Infirmary under Mr. John Duncan, whose clinical tutor and private assistant he afterwards became. After a few months' experience in general practice he commenced practice as a surgeon in 1887, and in the following year was elected a Fellow of the Royal College of Surgeons of Edinburgh. At this time, along with Mr. Harold Stiles, he ran a most successful coaching class in anatomy and pathology for the second professional examination. He was one of the earliest workers in the College of Physicians laboratory when this was in Lauriston-lane, and it was here that he did a great deal of the work for his M.D. thesis on Tuberculosis of Bones and Joints, for which he received a gold medal five years after graduation, and was appointed joint holder of the Freeland-Barbour Fellowship by the Royal College of Physicians. He acted for a time as assistant to Prof. Greenfield, and to this experience, no doubt, was due in part his keen and sustained interest in surgical pathology. In 1888 he became a B.Sc. in public health. About this time he started lecturing on surgery in Minto House, where he was associated with Symington. In 1892 he was appointed assistant surgeon to the Royal Infirmary, and two years later surgeon to the newly opened Deaconess Hospital. On the retiral of Prof. Chiene in 1909, he was appointed, after a close contest with Mr. James Hodsdon, to the vacant chair of systematic surgery.

During his years of professorship there were few students who attended his morning lectures who did not feel the spell of his personality and his refreshing vigour. He had a naturally attractive voice and never at a loss for a word, he presented his subject with a racy force that appealed to the imagination and aided the memory, while his skill with instance and illustration constantly added a lighter touch. His lectures were always carefully prepared, but he could lecture at a moment's notice, presenting his subject as fluently and as carefully as if there had been time for the usual preparation. In addition to the spoken word, he made a point of illustrating his lectures by demonstrations, and was one of the first to introduce the epidiascope, and later was probably the first surgeon in this country to employ the cinematograph for teaching purposes. In this way rare cases and exceptional operations could be demonstrated to his lecture class by films made under his own supervision. His interest in the students was not confined to their work, for he was an enthusiastic supporter of the athletic club and followed its activities keenly. He delighted to entertain a number of students or residents from the infirmary at his country house in Gilmerton when the felling of trees and the sawing of logs formed an integral part of the programme along with tennis or croquet. He himself was a keen sportsman, golf, shooting, fishing, and bicycling claiming in him a devotee. As an operator he was skilful and daring. He was at his best in difficult and dangerous cases, and his results were often brilliant. He had a *flair* for diagnosis, his gift at times being almost uncanny. In the technique and organisation of surgery he was one of the first to recognise the great progress which had developed in America, and he did much to incorporate in his own practice the improvements and methods observed on his many visits to American clinics, where he was always an honoured visitor.

Much of Prof. Thomson's reputation was due to the valuable contributions he made to medical literature. His original writings covered a wide part of the field of modern surgery. One of his best known contributions was a monograph on Neuroma and Neurofibromatosis, which was published in 1900, and later was translated into French. He wrote frequently for the medical journals, and especially in the *Edinburgh Medical Journal*, of which he was joint editor for several years. With his colleague, Mr. Alexander Miles, he published in 1904 a manual of surgery, in two volumes. Since then the manual has passed through numerous editions, and has been extended to four volumes. This text-book has been recognised as one of the best in the English language. Prof. Thomson was a member of Council of the Royal

College of Surgeons of Edinburgh, and frequently represented the College at medical congresses abroad; but for his health he would have succeeded to the Presidency of the College in the year of his retirement. He was consulting surgeon to the Royal Infirmary and to the Deaconess Hospital, and enjoyed honorary membership of the French Association of Surgeons and of the American Society of Clinical Surgery, and an Honorary Fellowship of the American Surgical Association. During the war he acted as consulting surgeon to the Third Army of the British Expeditionary Force, and for his services was awarded the C.M.G.

Prof. Thomson was buried at Gibraltar, and is survived by his wife.

GUY ALFRED WYON, M.D. EDIN.

Dr. G. A. Wyon, lecturer in pathology at the University of Leeds, died on March 2nd, in his fortieth year, after a short illness of influenzal character.

Guy Alfred Wyon was a son of Allan Wyon, F.S.A., the medallist, who belonged to the family of engravers of that name so long associated with the Mint. He was born in Hampstead in 1885, went to school at Highgate, and then graduated B.Sc. at London University. He received his medical education at Edinburgh University, qualifying M.B., Ch.B. in 1910, and there five years later he obtained his M.D. After some experience as house surgeon and house physician at the East Suffolk and Ipswich Hospital, and later as a general practitioner in the East End of London, Dr. Wyon joined the R.A.M.C. in 1915 and was sent to Salonika. On returning from that theatre of war, however, the strong bent of his mind for medical work of a scientific character asserted itself, and under the Medical Research Committee he was associated with the late Prof. Benjamin Moore in some useful work on the causation and prevention of T.N.T. poisoning, which is described in the M.R.C. Report, No. 58. He spent the latter part of the war in France attached to the 13th Casualty Clearing Station, and was busy with researches in all the quieter periods. These he carried out in the different mobile laboratories which were attached to the Casualty Clearing Station. About the time of the Armistice he took charge of No. 16 Mobile Laboratory and worked in the neighbourhood of Namur until demobilised.

Dr. Wyon joined the department of pathology at Leeds University in December, 1919, and occupied the position of lecturer in that department at the time of his death. While at Leeds he published some interesting work on bacterial nutrition, with special reference to the significance of amino-acids and vitamins. Tall in stature and possessed of an unusual gentleness of character, Wyon was an arresting personality and he had won a special place for himself in the hearts of many at the University of Leeds which will not easily be filled. As a worker he had two specially marked characteristics: one was his anxiety to get at the fundamental aspects of all problems which he tackled, and the other his enthusiasm and alacrity in bringing new methods to bear on his work. The contribution which he made to progress in the centre in which he worked was much greater than can be gauged by his published work alone. He is survived by his widow, formerly Miss Hitchcock, of Bures, Suffolk, and three children.

THE LATE DR. CLEMENT HADLEY.—The death is announced of Dr. Clement Hadley, second son of the late John Joseph Hadley, M.R.C.S., of Birmingham, at Leicester on March 11th, in his seventy-ninth year. Dr. Hadley qualified M.R.C.S. Eng. 1871, and L.R.C.P.I. & L.M. 1880, and subsequently practised at Ashted-row, Birmingham, for over 30 years, and at Shilton, near Coventry, for 14 years. He leaves a widow and two sons and two daughters.

UNIVERSITY OF LIVERPOOL.—Dr. John Hay, senior hon. physician to the Royal Infirmary, has been appointed Professor of Medicine at the University.

Medical News.

UNIVERSITY OF CAMBRIDGE: *The John Lucas Walker Studentship.*—Applications for this studentship, the holder of which shall devote himself (or herself) to original research in pathology, are invited, and should be sent, accompanied by copies of papers containing published work, testimonials, and references, before May 1st next, to Prof. H. R. Dean, Pathological Laboratory, Medical School, Cambridge, to whom also applications for further information regarding the studentship may be addressed. The studentship is of the annual value of £300, and is tenable, under certain conditions, for three years from May 31st, 1924.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The usual list of Fellows, Members, and extra-licentiate has just been issued, this time separately from that of licentiates and diplomates in special subjects; 14 Fellows were admitted during the year 1923, the total number now being 374. The senior Fellows are: (1870) Sir William Selby Church and Sir Dyce Duckworth, (1873) Sir Richard Douglas Powell, (1874) Dr. Henry Gervis and Dr. John Buckley Bradbury, (1876) Sir David Ferrier, (1877) Dr. Michael Grabham, (1878) Dr. J. Mitchell Bruce and Dr. C. G. H. Bäumler, (1879) Sir John Williams. Fifty-nine Members were admitted during the year, the total number now being 636. The senior Members are: (1860) Dr. Clarence Cooper, (1865) Dr. Heywood Smith, (1866) Dr. Francis V. Paxton.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of Fellows will be held at the College on July 3rd for the election of three Fellows into the Council in the vacancies occasioned by rotational retirement. The occasion will mark an innovation, for a reception will be held by the President and Council from 4 to 6 P.M. on the same day, and the annual exhibition of additions to the museum will be open for inspection at that time. Formerly, when Fellows had to attend at the College to record their votes, the annual exhibition of additions to the museum was held on the day of the Council election, but in recent years the exhibition has been held in October. It is now proposed to revert to the custom of holding the exhibition on the same day as the Council election, and to hold a reception in connexion with it.

JOULE MEMORIAL LECTURE.—The third memorial Joule lecture was delivered on March 4th at the rooms of the Manchester Literary and Philosophical Society, by Prof. A. V. Hill, who took for his subject Thermodynamics in Physiology. He said that the guiding principles in the life and labour of Joule—those of precise measure and accurate definition—were the essential needs of physiology at the present time, and the hour would come when physiology would find its Einstein, its Maxwell, and its Laplace, but to-day it required a Joule—indeed, a dozen Joules—to carry out accurate measurements and to formulate precise definitions which were essential if it was to secure its promotion from the nursery of observation and wonder to the school-room of exact science.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A three weeks' course on Diseases of Children will be given at the Royal Waterloo Hospital for Children and Women from March 17th to April 5th. The various aspects of the subject will be dealt with by lecture-demonstrations, ward work, and out-patient clinics by the members of the staff according to the time-table set out in the syllabus. At the Royal Westminster Ophthalmic Hospital there will be a course on Ophthalmology from March 31st to April 17th, which will include clinical instruction every afternoon from 2 P.M., and special demonstrations twice a week on Medical Ophthalmology and Methods of Examination. At the London Temperance Hospital, Hampstead-road, there will be an intensive course from March 31st to April 12th. Practical demonstrations will be given each morning from 10.15 to 12.15, and the afternoons, from 2 to 4 P.M., will be devoted to ward rounds and out-patient clinics. In addition, special demonstrations will be given on Saturdays at Bethlem Royal Hospital on Mental Diseases, and on Ophthalmology at the Royal Westminster Ophthalmic Hospital. There will also be a lecture each day at 4.30 P.M., to which all members of the medical profession are invited, and the opening one will be given by Sir Humphry Rolleston on March 31st, followed among others, by Mr. V. Zachary Cope, Mr. Ernest Clarke, Dr. Soltau Fenwick, and Mr. W. Ernest Miles. Copies of the syllabus with full particulars can be obtained on application to the Secretary to the Fellowship of Medicine, 1, Wimpole-street, London, W. 1.

Mr. R. A. Bickersteth, F.R.C.S. Eng., honorary consulting surgeon to the Royal Infirmary, Liverpool, died at Bournemouth, on March 6th, in his sixty-second year.

HARVEIAN SOCIETY OF LONDON.—A meeting will will be held at Paddington Town Hall on March 20th, at 8.30 P.M., when Prof. J. Ernest Frazer will deliver the annual Harveian lecture.

CHELSEA CLINICAL SOCIETY.—A meeting of the Society will take place at St. George's Hospital on March 18th at 8.30 P.M., when a discussion on the Treatment of Common Eye Disorders will be opened by Dr. Ernest Clarke.

ELIZABETH GARRETT ANDERSON HOSPITAL.—The annual meeting of the hospital, Euston-road, N.W., will be held to-day, Friday, March 14th, at 3 P.M., under the chairmanship of Lord Riddell. Mrs. Fawcett will speak.

RADIUM INSTITUTE, LONDON.—With the approval of the King, Sir Anthony A. Bowlby has been elected Chairman of the Institute in place of the late Sir Malcolm Morris. Sir George Blacker has been elected a member of the Committee.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—The sixth meeting of the session will be held at the Miller General Hospital, Greenwich, to-day, Friday, March 14th, at 8.45 P.M., when a paper will be read by Dr. Montague L. Hine on the Interdependence of Ophthalmology and General Medicine.

HARNETT *v.* BOND AND ADAM: STAY OF EXECUTION.—In the King's Bench Division on March 11th Mr. Justice Lush granted Dr. G. H. Adam an extension of a stay of execution with regard to the damages awarded against him. This followed on an assurance given by counsel for the Crown that security would be given for the outstanding damages of £20,000 before March 21st. Extension was granted without any condition until the hearing of the appeal.

SOCIETY OF MEDICAL OFFICERS OF HEALTH: *Maternity and Child Welfare Group.*—A meeting of this group will be held in the house of the society, 1, Upper Montague-street, Russell-square, W.C., at 8 P.M., on March 20th. Dr. Robert Hutchison will read a paper, illustrated by lantern slides, on the Feeding of Children after the Period of Infancy. The lecture is open to all interested in maternity and child welfare work, and members of the dental and school medical groups are invited to attend.

THE JOURNAL OF LARYNGOLOGY, LIMITED.—The conductors of the *Journal of Laryngology* held their annual dinner on Friday, March 7th, at Pagani's Restaurant. Sir William Milligan presided, and gave the toast of The Prosperity of the Journal in a speech explaining the sound grounds on which those responsible believed that the progress already made was likely to continue. The editor of the *Journal*, Dr. Logan Turner, gave figures which showed that the journal was well supported, but had a right to count upon many more adherents. The toast of The Guests was replied to by Sir Charles Ballance and Sir Squire Sprigge, who bore testimony to the industry and accuracy which were required to make adequate abstracts of scientific communications.

INSURANCE FUNDS AND VOLUNTARY HOSPITALS.—In reply to the statement made by Lord Colwyn at the annual meeting of the Manchester Children's Hospital concerning the surplus funds of approved societies (THE LANCET, March 8th, p. 521), a letter has appeared in the press from Sir Thomas Neill, chairman of the National Amalgamated Society. Sir Thomas Neill states that it is true that the last valuation of approved societies disclosed a surplus of £17,000,000, but of this amount £8,000,000 was set aside by the Government Valuers as a reserve. The remaining £9,000,000 was declared disposable, and in accordance with the provisions of the National Insurance Acts was distributed by the various societies among their members in the form of certain benefits defined in the Acts—including dental, optical, and home convalescent treatment, the provision of medical and surgical appliances, and contributions to voluntary hospitals in respect of the treatment of insured persons. The Industrial Assurance Approved Societies, which adminster benefits to over six million insured persons out of a total of 15 million insured persons, has contributed over £174,000 to voluntary hospitals throughout the country, and Manchester institutions have received over £5400. It is the earnest hope of the approved societies that all available surplus shall be used to the utmost to support voluntary hospitals, because by doing this many wards and beds have been kept open which would otherwise have been closed down.

THE KING has sanctioned the following appointments to the Order of the Hospital of St. John of Jerusalem in England: Sir Gould May, Sir John Bland-Sutton, P.R.C.S., and Captain James Atkin Henton White, R.A.M.C., to be Knights of Grace; and Dr. Alfred Bakewell Howitt to be an Esquire.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At the monthly meeting of the Faculty on March 3rd Dr. James Duncan Maclaren was admitted as an Honorary Fellow, and Dr. Dattatraya Ganesh Kotibhaskar was admitted (after examination) as a Fellow.

DR. ROBERT HUNTER STEEN, medical superintendent of the City of London Mental Hospital, has resigned the post of professor of psychological medicine and out-patient physician for mental diseases at King's College Hospital, Denmark Hill, and the Council of King's College has conferred upon him the title of Emeritus Professor of Psychological Medicine.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—Hospitals in the County of London or within nine miles of Charing Cross, desiring to participate in the grants made by this Fund for the year 1924, should make application before March 31st to the hon. secretaries of the Fund at 7, Walbrook, London, E.C. 4. Applications will also be considered from convalescent homes which are situated within the above boundaries or which, being situated outside, take a large proportion of patients from London.

ENCEPHALITIS LETHARGICA IN ENGLAND AND WALES.—Cases of this infectious disease to the number of 86 were notified in England and Wales during the week ended March 1st, the numbers in preceding weeks (working backwards) being 61, 33, 37, 19, 18, 18, 10, 8, taking them back to the beginning of the year. Of the 86 cases the districts of notification were: County of London 3 (Bethnal Green, Fulham, Stepney); Cheshire 8 (Birkenhead 1, Stockport 2, urban districts 5); Cumberland, 1; Derby, 1; Dorset, 1; Durham, 2; Essex, 3; Kent, 1; Lancashire, 58 (Blackpool 1, Bolton 3, Bury 1, Liverpool 2, Manchester 22, Oldham 6, Rochdale 1, Salford 9, Ashton-under-Lyne 1, Eccles 1, Ince-in-Makerfield 1, Irlam 1, Middleton 1, Radcliffe 1, Swinton and Pendlebury 1, Tyldesley with Shakerley 1, Westhoughton 1, Whitefield 1, Whitworth 2, Worsley 1); Hants, 1 (Winchester); Surrey, 1; Sussex, 1; Warwick, 2 (Birmingham); Yorks, W.R., 2 (Halifax 1, Hemsworth 1); Glamorgan, 1. It will be seen that the adjacent counties of Lancaster and Chester account for all but 20 of the cases.

NORFOLK AND NORWICH HOSPITAL.—At a recent quarterly meeting of the governors of this hospital the report of the board of management showed that the number of in-patients admitted during the quarter had been 823, compared with 778 in the corresponding quarter of last year. The daily average of in-patients was 239, and the number of operations performed 739. The number of cases treated in the out-patient department had been 1079 (1084 last year), and the accidents and casualties 1767, as against 1520 last year. The board reported that they anticipated that the heating and hot-water supply from the new boiler-house would be connected up during the next few weeks, and that the extensions to the electrotherapeutic department, as well as the extensions and alterations to the laundry, were nearing completion. Mr. Donald Day, senior surgeon to the hospital, had retired, and was appointed a consulting surgeon. Mr. A. J. Blaxland was promoted to the post of honorary surgeon, and Mr. W. B. Bulman was appointed honorary assistant surgeon. A new arrangement had been made with regard to children operated on in the out-patient department for the removal of tonsils and adenoids. For the future these patients would be transported to their own homes in ambulances provided by the British Red Cross Society at a small charge. Mr. S. H. Barton, chairman of the board of management, in moving the adoption of the report, made special reference to the treatment of cases of diabetes by insulin, and stated that this hospital was one of the first to adopt this treatment. There had been as many as 14 such cases at one time under treatment, and the usual number was eight. Such specialised treatment as this created a demand for beds, but owing to the cost of insulin it threw a strain on the finances of the hospital. The ward which had been reserved for discharged soldiers was now available for civilian cases, as there were now only eight soldiers in the hospital, against 40 last year. This would throw an additional burden on the hospital finances, as there would be a loss in payments of over £1500, but the board felt that the civilian patients, and especially the members of the Contributory Scheme, who formed 70 per cent. of the number, would do all in their power to assist in making up the deficit.

NATIONAL BUREAU FOR PROMOTING THE GENERAL WELFARE OF THE DEAF.—Under the auspices of this Bureau an important conference of societies engaged in the promotion of the welfare of the deaf will be held at the Kingsway Hall, Kingsway, London, W.C., on March 19th, at 3 P.M., when Lord Charnwood will preside.

WELSH NATIONAL SCHOOL OF MEDICINE.—The Senate of the University of London has now recognised the final years of study held at the Cardiff Royal Infirmary as courses qualifying for the examinations of the University of London. Prof. Graham Brown has succeeded Prof. A. M. Kennedy as dean of the school.

MEDICO-LEGAL SOCIETY.—A meeting will be held at 11, Chandos-street, Cavendish-square, London, W. 1, on March 18th at 8.30 P.M., when notes will be read on Cases of Sudden Death from Inhibition and their Medico-Legal Bearings, by Dr. Percy B. Spurgin and Sir Bernard Spilsbury. Any members who can contribute notes of similar cases are requested to take part in the discussion.

DONATIONS AND BEQUESTS.—For the British Empire campaign the following donations have been received recently: £1000 from Mr. Jackson Russell, of Archerfield, Dirleton, East Lothian; £1111 collected by the County of London Branch, British Red Cross Society, including £1000 raised by the Holborn Division (Commandant, Miss Geering); and £200 from Mr. S. G. Asher, chairman of the council, Middlesex Hospital Medical School. A large number of anonymous gifts have also been received.

MAUDSLEY HOSPITAL.—The second part of the seventh course of lectures and practical courses of instruction for the diploma in psychological medicine will begin on March 31st. Lectures will be given by Dr. Bernard Hart, Dr. Edward Mapother, Sir Frederick Mott, Dr. C. Hubert Bond, Dr. F. C. Shrubsall, and Dr. W. C. Sullivan, and 12 clinical demonstrations in neurology will be given by Sir Frederick Mott and Dr. F. L. Golla. Further particulars will be sent on application to the director of the pathological laboratory at the hospital, Denmark Hill, London, S.E. 5.

THE INSULIN TREATMENT OF DIABETES IN SCOTLAND.—The Scottish Board of Health have had under consideration the position of Poor-law authorities in relation to the provision of insulin treatment for diabetic patients. In regard to persons actually on the roll of poor it is obviously the duty of the parish council to provide whatever medical treatment and medicines the medical officer considers necessary, and the Board do not anticipate that any parish council will raise difficulties in cases where the medical officer considers that insulin should be administered. There is a further class of patient in respect of whom the parish council may be called upon to consider an application for the provision of insulin treatment. That is the patient who is in possession of means which, according to normal Poor-law standards would be sufficient for his ordinary maintenance. Such means may not, however, be sufficient to enable him to purchase the insulin necessary at its present cost, and he may suffer hardship through inability to obtain it. The Board accordingly recommend parish councils to give sympathetic consideration to any application for assistance in the provision of insulin by or on behalf of any person falling within the class referred to above.

CATHOLIC MEDICAL GUILD FOR EDINBURGH.—The inaugural meeting of the Catholic Medical Guild of SS. Luke, Cosmas, and Damian was held at the Lauriston Hall, Edinburgh, on Feb. 21st. Dr. George Matheson Cullen is the Master of the Guild, with the Rev. Thomas J. Agius, M.D., for spiritual director and Dr. Isabel M. A. Doeg as hon. secretary. The guests included Canon Mullan, Canon McGettigan, Fr. J. Nicholson, Fr. Lennon. Mgr. T. Miley proffered an apology for his inability to attend. The address was given by Dr. Thomas J. Colvin, of the Glasgow Branch of the Guild. He dwelt on the widespread influence of the Catholic Medical Guild, not only in the British Isles but on the Continent and wherever the Catholic faith was spread. Its importance as a means of adjusting medico-ethical relations and of spreading sound scientific and moral principles might be gauged by the activities of the various branches. After a vote of thanks to the speaker, the meeting took up a discussion on birth-control, examining it in relation to the natural law, to the marriage contract, the duties towards society and the Supreme Lawgiver, as well as in its relation towards the fact of Christianity. On each of these four main grounds the meeting rejected and condemned the artificial interference with the physiological and psychological laws of reproduction as contrary to the Christian code of morality and against the natural law.

The official organ of the Catholic Medical Guild is the *Catholic Medical Guardian*, edited by Lieut.-Colonel P. W. O'Gorman, C.M.G., I.M.S., and published by Messrs. Burns, Oates, and Washbourne, 28, Orchard-street, London, S.W. 1.

Parliamentary Intelligence.

HOUSE OF COMMONS.

TUESDAY, MARCH 4TH.

Encephalitis Lethargica.

Mr. ALFRED T. DAVIES asked the Minister of Health whether there had recently been an increase of sleepy sickness (encephalitis lethargica) in various districts; to what was this increase attributed; and what were the conclusions of the medical experts who had been dealing with the situation.—Mr. WHEATLEY replied: The notification returns show that encephalitis lethargica has increased in prevalence during the past four weeks, but that this increase has occurred almost entirely in Lancashire. The disease is one which shows notable seasonal variations, both general and local, but the cause of these variations is at present obscure.

WEDNESDAY, MARCH 5TH.

Insurance Patients in Poor-law Hospitals.

Sir KINGSLEY WOOD asked the Minister of Health whether he had received any representations from boards of guardians calling attention to the number of persons insured under the National Insurance Acts who were admitted to Poor-law hospitals and in respect of whom the guardians were precluded from receiving any benefit for the treatment afforded; and whether he proposed to take any action in the matter.—Mr. WHEATLEY replied: Representations to the effect referred to by the hon. Member have been received, but I would point out that boards of guardians have the ordinary powers of recovery of expenses incurred by them in providing treatment in a Poor-law hospital to a person insured under the National Health Insurance Acts as in the case of all other persons for whom such treatment is provided.

Wrongful Detention in an Asylum Case.

Mr. PENNY asked the Attorney-General whether the whole or any part of the damages awarded against the defendants in a case of wrongful detention in an asylum tried in the King's Bench Division of the High Court of Justice recently was to be paid by the Crown.—Mr. WHEATLEY replied: An appeal is being entered against the judgment in this case. Under the judgment the sum of £5000 is to be paid to the plaintiff by the defendant, Dr. Bond. In accordance with the principle always observed where a public servant is sued in respect of actions taken in performance of his duty and the Crown undertakes the defence, this sum will be paid from public funds. An advance of £5000 is accordingly being made from the Civil Contingencies Fund, and the House will be asked to vote this sum and any further sum that may be found necessary by a supplementary vote on the Board of Control estimates. As the appeal case is sub judice it would not, I think, be possible to debate the case in the House pending the result.

Dissolution of Poplar and Stepney Asylum District.

Mr. LANSBURY asked the Minister of Health whether he was aware that the guardians of the Poplar parish were very strongly opposed to the dissolution of the Poplar and Stepney sick asylum district recently sanctioned by him; whether he would explain why he had agreed to the amalgamation of the Poor-law unions within the Stepney borough into one union, leaving Poplar as the one parish in the Tower Hamlets outside the scheme; and whether, in view of the fact that the Government was now pledged to deal with the reform of the Poor-law, he would reconsider his decision and postpone the dissolution of the district and the unification of the unions named above until the whole question of the reform of the Poor-law had been dealt with in a comprehensive manner.—Mr. WHEATLEY replied: I am aware of the facts stated in the first part of the question. The change which I have approved is in the direction of making Poor-law and municipal areas conterminous, and, as my hon. friend knows, it is not to take effect until March 31st, 1925. If a scheme of reform is brought into operation before that date this particular question will no doubt be merged in the larger issue, but in the meantime I see no need to alter my decision.

Trevethin Report and Venereal Disease.

Mr. WALTER GUINNESS asked the Minister of Health whether Clause 16 of the Trevethin Report dealing with the expenditure of money for reducing venereal disease has yet been considered by the Government; whether the question of Government financial assistance to the work of voluntary institutions has been decided; and whether, in view of the fact that the Society for the Prevention of Venereal Disease and the National Council for Combating Venereal Diseases had both unconditionally accepted the Trevethin Report, and had met in conference and had determined on joint

action for giving effect to its recommendations, he will cause the maximum grant, which is to be made by the Government, to be divided in an equitable proportion between the two organisations.—Mr. WHEATLEY replied: I have now under consideration the recommendations in the Trevethin Report, including the question of financial assistance from the Exchequer to the work of voluntary organisations, but I am not yet in a position to say how any Government grant for this purpose will be allocated.

Overcrowding and Small-pox.

Mr. FRANK LEE asked the Minister of Health whether he will direct medical officers of health to take note of the number of rooms in each house from which cases of small-pox are reported with the number of people living therein with a view to ascertaining whether, and, if so, to what extent, overcrowding has any bearing upon the prevalence of the disease.—Mr. WHEATLEY replied: Medical officers of health have already been asked to attempt to measure the influence of domestic overcrowding upon the incidence of notified diseases, and this is their usual practice. I will consider whether it is practicable to do anything further in regard to small-pox.

Immunising Children against Diphtheria.

Major MOULTON asked the Minister of Health whether his attention had been drawn to the remarkable results obtained by the Department of Health in New York in immunising children against diphtheria; and whether he proposed to take steps to enable parents who desire it to obtain the advantages of this treatment for their children free of charge.—Mr. WHEATLEY replied: The answer to the first part of the question is in the affirmative. This form of preventive treatment was the subject of a special medical report by my department in 1921, and in July, 1922, a memorandum was issued to local authorities drawing attention to the practical advantages of the method. The question of offering the treatment to parents is for the decision of local authorities or the managing bodies of institutions, but my department has offered expert advice and assistance in the application of the treatment by those who desire to adopt it.

THURSDAY, MARCH 6TH.

Amalgamation of Naval and Military Hospitals.

Commander BELLAIRS asked the Chancellor of the Exchequer whether any advance had been made in amalgamating naval and military hospitals in different parts of the world and selling the surplus sites; and what had been the decision in regard to the military parade ground and naval hospital at Hong Kong, which occupy valuable sites and the former of which the business community of Hong Kong had been anxious to buy for a long time.—Mr. SNOWDEN replied: The War Office has assumed responsibility for the treatment of all naval sick at Gibraltar, and the Admiralty has taken over the treatment of military sick at Chatham, with the result that one naval and one military hospital has been closed. As regards Hong Kong, negotiations are proceeding between the War Office and the Colonial Government for an exchange of properties, which include the existing parade ground and military hospital. If and when a settlement of this question is reached the question of the hospital accommodation required by the navy and the army will be reconsidered.

Sanatorium Schools for Tuberculous Children.

Mr. TURNER asked the President of the Board of Education whether he would reconsider the restrictions imposed in Circular 1270, issued by the Board on July 5th, 1922, under which the grant payable to the managers of voluntary sanatorium schools for tuberculous children was to be limited in respect of 1922–23 to the amount payable on the average attendance for the year 1921–22.—Mr. C. TREVELYAN replied: I do not propose to maintain the restrictions imposed by Circular 1270 on the amount of grant payable to managers of voluntary sanatorium schools which are in receipt of grant from the Board.

Deaths from Lead Poisoning.

Mr. EDMUND HARVEY asked the Secretary of State for the Home Department whether, seeing that the report of the Chief Inspector of Factories showed that a larger number of deaths from lead poisoning occurred in 1922 than in any previous year since 1900, what steps he proposed to take in order to put an end to the loss of life in the industries concerned.—Mr. HENDERSON replied: I presume the hon. Member refers only to the pottery industry. In no other industry was there a larger number of deaths from lead poisoning in 1922 than in any previous year since 1900. The hon. Member must not take the number of fatal cases from lead poisoning in 1922 as affording any indication of present conditions. In most fatal cases the disease has been contracted a long time previously, and as the hon. Member will find from the particulars of the 1922 cases, which will be circulated with the official report, the deceased had, in practically every instance, been employed for a long period of years in the industry. In fact, with few exceptions, the period of employment was not less than 20 years, and in two cases the worker had ceased to be employed in the industry some years previously. After an exhaustive inquiry by a departmental committee a new code of regulations for the industry was brought into operation in 1913, and since then there has been a great reduction in the total number of cases. Every effort is being made to reduce the number still further, but the hon. Member may rest assured that the situation will be carefully watched.

Mr. EDMUND HARVEY asked the Secretary of State for the Home Department whether his attention had been called to the fact that out of the 42 cases of lead poisoning notified in 1922 among workers in the manufacture of china and earthenware 17 were fatal; and whether he could give the ages and sex of those who died and state on what processes they were employed.—Mr. HENDERSON replied: The numbers stated in the question are those given in the report of the Chief Inspector of Factories for 1922. The following are the particulars asked for, together with the duration of the worker's employment in the industry:—

Case No.	Sex.	Age.	Duration of employment.	Process.
1	M.	51	35 years.	Glost placer.
2	M.	44	31 ,,	Dipper.
3	M.	53	Over 20 ,,	Glost placer.
4	M.	44	Not worked since 1916.	,, ,,
5	M.	43	28 years.	,, ,,
6	M.	58	29 ,,	,, ,,
7	M.	51	30 ,,	Dipper.
8	M.	60	41 ,,	Glost placer.
9	M.	60	46 ,,	,, ,,
10	M.	40	20 ,,	Dipper.
11	M.	55	37 ,,	Glost placer.
12	M.	61	Over 40 ,,	Dipper.
13	M.	44	31 ,,	Glost placer.
14	M.	42	16 ,,	,, ,,
15*	F.	55	7 ,,	Dipper.
16	F.	61	23 ,,	Aerographer.
17	F.	46	Not worked since 1904.	Warecleaner.

* Died of cancer of the stomach accelerated by lead poisoning.

Assaults on Children.

Sir THOMAS BRAMSDON asked the Secretary of State for the Home Department if he had received copies of resolutions, passed by various organisations and public bodies with reference to assaults upon children, calling attention to the inadequate sentences passed on offenders, and to the need for an investigation; and whether, in order to lessen the number of these offences, he would appoint a departmental committee with wide terms of reference, including medical and legal experts, social workers, and representative women, to inquire into the whole subject.—Mr. HENDERSON replied: My attention has been called to this matter, and I have arranged that a conference shall be held at the Home Office when the whole question can be discussed. As at present advised I do not think that any useful purpose would be served by the appointment of a departmental committee.

Pensions for Blind Ex-Soldiers.

Lieut.-Colonel RUDKIN asked the Minister of Pensions if he was aware that there were many ex-Service men who had become blind since their discharge, but were not in receipt of any State aid; and whether he would give an opportunity for such cases to be sympathetically considered by his department, with a view to pension or other assistance.—Mr. F. O. ROBERTS replied: I am not aware of any cases of blinded ex-Service men, whose condition is either due to or aggravated by war service, who are not in receipt of pension from my department.

Small-pox in England and Foreign Countries.

Mr. BROAD asked the Minister of Health the number of cases of, and deaths from, small-pox reported in Germany, Japan, and England and Wales, respectively, during each of the years 1921, 1922, and 1923.—Mr. WHEATLEY replied: The following statement gives such particulars as are available, although the figures are not necessarily strictly comparable:—

—	Number of—	1921	1922	1923
Germany	cases	688	215	17*
	deaths	?	?	?
Japan	cases	889	?	?
	deaths	212	?	?
England and Wales	cases	336	973	2500*
	deaths	5	27	7*

* Provisional figures.

MONDAY, MARCH 10TH.

Ship-breaking Workers.

Mr. WATSON asked the Minister of Health if his attention ad been drawn to the injurious effect of ship-breaking on ie health of the workers engaged in that industry; if he as aware that the men engaged on the acetylene burners ere only able to continue for a few weeks without breaking own; that in many cases no effective gas-masks or fresh ilk was provided; and would he take steps to inquire nto this matter and bring pressure to bear upon the ship-reaking companies to protect the health of their workers.—Ir. HENDERSON, the Home Secretary, replied: I have been sked by my right hon. friend to reply. The employment a question which has developed rapidly during the last wo or three years has given rise to a number of cases of ead poisoning. It has been receiving the special attention f the Factory Department, and as a result of visits by the edical inspectors arrangements have now been made by he occupiers of practically all the yards for a periodic edical examination of the workers, this being, I am dvised, the most practicable and effective precaution. It s hoped that these arrangements will prove effectual, but he situation will be carefully watched, and, if necessary, urther measures will be considered.

National Insurance Commission.

Sir KINGSLEY WOOD asked the Prime Minister if he ould announce the terms of the Royal Commission on Vational Insurance.—Mr. MACDONALD replied: The terms of eference have been drafted provisionally, but are not yet nally settled. A promise was given that before they were ettled they should be shown to representatives of the edical profession and of the approved societies.

Harnett v. *Bond and Adam.*

Mr. COMYNS CARR asked the Prime Minister whether he ad now come to a decision as to the promised inquiry into he questions of lunacy law and administration raised by the ase of Harnett *v.* Bond and Adam; and whether he could now ive an undertaking that the inquiry would not be held up ending the determination of possible appeals in that case o the Court of Appeal and the House of Lords.—Mr. OSTELLO asked the Prime Minister whether, when setting p the proposed body to inquire into the present lunacy aws and their administration, he would bear in mind the esirability of making the terms of reference to such body ufficiently wide to include an investigation into the internal dministration and management of public and private nstitutions for the detention of lunatics, with special egard to their treatment and the conditions under which hey received visitors and correspondence; and whether e would instruct such body to inquire into and report pon the feasibility of establishing hospitals to which oubtful cases might go for treatment, without unneces-arily incurring for themselves and their families the stigma f insanity.—Mr. MACDONALD replied: An application as been made to the Court of Appeal for an early hearing f this case, and the Court of Appeal have intimated their villingness to afford as early a hearing as possible. The pplication was made to prevent the possibility of embarrass-ment to any committee that may be appointed by reason f the Harnett case being still sub judice. In these circum-tances it is not possible for me, at this moment, to give ny undertaking such as is suggested, but the suggestions f Mr. Costello regarding the terms of reference will be orne in mind. Meanwhile the preliminaries to setting up he Commission are being proceeded with.

Sheffield Hospital Scheme.

Mr. CROOKE asked the Minister of Health if he was aware f the scheme by which the Sheffield hospitals were run by joint council, with the result that the institutions were ow self-supporting; and whether he would institute an nquiry into the working of this scheme in order to facilitate ts adoption in other municipalities, in view of the financial ifficulties at present obtaining in most hospitals.—Mr. REENWOOD replied: The Sheffield Joint Hospitals Council re not responsible for the administration of the voluntary ospitals in their area, but my right hon. friend is aware f the admirable work done by the council in organising he systematic collection of weekly contributions. It is ot necessary to institute any inquiry into the working of he Sheffield scheme, as this is already well known among ospital authorities. The adoption of this or other schemes f mass contribution in other areas is a matter for local ecision, but my right hon. friend is glad to learn that he question has been engaging the attention of many ocal voluntary hospital committees.

Future of Convalescent Centre.

Mr. HENDERSON asked the Minister of Pensions if he would state the number of trainees who had been discharged since Jan. 1st, 1924, from the Prince of Wales's Convalescent Centre, Barry, South Wales; whether he would suspend all further discharges; and whether he would give an assurance that this centre was not to be closed.—Mr. F. O. ROBERTS replied: The number is 120. As I have already stated the future of this centre is under consideration, but discharges must necessarily continue as the men complete their courses of treatment and training.

TUESDAY, MARCH 11TH.

Sulphuric Ether.

Mr. LORIMER asked the President of the Board of Trade if he would state the number of gallons of sulphuric ether imported into this country during 1923, and the number of gallons produced in Great Britain during the same period.—Mr. SIDNEY WEBB replied: The total quantity of sulphuric ether registered as imported into the United Kingdom during the year 1923 was 16 gallons. This quantity is inclusive of direct imports, if any, into the Irish Free State up to March 31st of the year in question. I am not in a position to state the quantity of sulphuric ether produced in the United Kingdom during the past year.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

D. Glass to be Surg.-Lt.

Surg. Comdr. G. E. Duncan is placed on the Ret. List, with the rank of Surg. Capt.

Surg.-Lt. (Emergency) R. R. Baker is reinstated on Active List as Surg.-Lt.

Surg.-Lt. J. R. Brennan to be Surg. Lt.-Comdr.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. H. Rogers retires on ret. pay.

Maj. and Bt. Lt.-Col. W. F. Ellis to be Lt.-Col.

Capt. T. R. Snelling retires, receiving a gratuity.

TERRITORIAL FORCE.

Maj. (Prov.) A. R. Moodie is confirmed in his rank.

Capt. C. Douglas to be Maj. (Prov.).

Capts. F. Harvey, D. L. Wall, and R. L. Williams, having attained the age limit, are retd., and retain the rank of Capt.

G. H. R. Gibson (late Canadian Army Med. Corps) to be Capt.

Lt. A. H. Richardson to be Capt. (Prov.).

ROYAL AIR FORCE.

R. H. Stanbridge is granted a short service commission as a Flying Officer.

Flight Lt. J. C. T. Fiddes is transferred to the Reserve, Class D.2.

Medical Diary.

SOCIETIES.

ROYAL SOCIETY, Burlington House, Piccadilly, W.

THURSDAY, March 20th.—4.30 P.M., *Papers to be read:* Sir Charles Sherrington, P.R.S., and E. G. T. Liddell: Reflexes in Response to Stretch (Myotatic Reflexes). R. Campbell Thompson: The Plants of the Assyrian Medical Tablets. (Communicated by W. B. Hardy, Sec. R.S.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, March 18th.

GENERAL MEETING OF FELLOWS: at 5 P.M.
Ballot for election to the Fellowship (names already circulated.)

PATHOLOGY: at 8.30 P.M.
Annual General Meeting.
Election of Officers and Council for 1924–25.
Demonstrations:
W. D. Newcomb: Cutaneous Dissemination in Carcinoma of the Breast.
Nathaniel S. Lucas: (1) A Spleen and Liver from an Ocelot suggestive of a Leukæmic Condition; (2) An Unusual Form of Avian Nephritis; (3) An Angioma from the Liver of a Slender Dog.
Papers:
A. B. Rosher: The Effects of Inoculation of Heterologous Antigens on a Steady Agglutination Titre, with reference to the Diagnosis of Enteric in Inoculated Subjects.
V. F. Allison: Effect of the Administration of Vaccine on the Lysozyme Content of Tissues and Secretions.

Wednesday, March 19th.

HISTORY OF MEDICINE: at 5 P.M.
Papers:
Mr. J. E. H. Roberts: The History of Trusses.
Mr. George W. Corner: Earliest Western Anatomical Texts.

Thursday, March 20th.

DERMATOLOGY: at 5 P.M. (Cases at 4 P.M.)
Cases will be shown

Friday, March 21st.

ELECTRO-THERAPEUTICS: at 8 P.M.
Discussion:
On the Clinical Results of Deep X Ray Therapy, to be opened by Dr. Harrison Orton, followed by Dr. William Mitchell (Bradford), Mr. Sampson Handley, Dr. Woodburn Morison (Manchester), Dr. Hope Fowler (Edinburgh), Dr. George Cooper (Leeds), Dr. Robert Knox, and Dr. Reginald Morton will take part.
N.B.—The X ray department of the Institute of Anatomy, University College, Gower-street, W.C. 1, will be open for inspection in the afternoon.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. 1.
MONDAY, March 17th.—9 P.M., Dr. R. A. Young: The Treatment of Pulmonary Tuberculosis. (Third Lettsomian Lecture.)

HARVEIAN SOCIETY OF LONDON.
THURSDAY, March 20th.—8.30 P.M., Meeting at Paddington Town Hall, Prof. J. E. Frazer: Annual Harveian Lecture.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.
THURSDAY, March 20th.—8.15 P.M., a Laboratory Meeting will be held at the Royal Army Medical College, Grosvenor-road, Millbank, S.W. The following, amongst others, will give Demonstrations: Lieut.-Colonels S. P. James, W. P. Macarthur, and H. Marrian Perry; Drs. J. G. Thomson, Broughton-Alcock, and C. M. Wenyon; I. M. Puri, M.Sc., and L. G. Saunders, M.Sc., of the Molteno Institute, Cambridge (by permission of Prof. G. H. F. Nuttall). Dr. Andrew Balfour, C.B, C.M.G., will show a Cinematograph Film—lent by the Rockefeller International Health Board—illustrating the Ætiology, Spread, and Prevention of Malaria.

MEDICO-LEGAL SOCIETY, 11, Chandos-street, Cavendish-square, W. 1.
TUESDAY, March 18th.—8.30 P.M., Dr. Percy B. Spurgin and Sir Bernard Spilsbury: Cases of Sudden Death from Inhibition and their Medico-Legal Bearings.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 18th.—5 P.M., Lieut.-Colonel Glen Liston, C.I.E.: The Plague. (Last Milroy Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.
MONDAY, March 17th, to SATURDAY, March 22nd.—BETHLEM ROYAL HOSPITAL. Course in Psychological Medicine. Tues. and Sat., 11 A.M., Dr. Thomas Beaton and Dr. Porter Phillips: The Psychoses.—CHELSEA HOSPITAL FOR WOMEN. Daily: Operations, &c. Mon., 2 P.M., Mr. Rivett: Affections of the Vulva. Tues., 5 P.M., Mr. Bonney: Symptoms produced by Pelvic Displacement. Wed., 2 P.M., Mr. Dodd: Salpingitis. Thurs., 2 P.M., Mr. Giles: Plastic Operations demonstrated in Modelling Clay. Fri., Mr. Comyns Berkeley: Operations.—ROYAL FREE HOSPITAL. Wed., 5.30 P.M., Dr. Heald: The Direct Current especially in Relation to Fractures and Injuries.—ROYAL WATERLOO HOSPITAL. Lecture-Demonstrations, Ward Work, &c. Mon., 2 P.M., Dr. Woodwark; 3 P.M., Dr. Barron; 4 P.M., Dr. Donaldson. Tues., 2 P.M., Dr. Moon; 3 P.M., Dr. Myers; 4 P.M., Dr. Davidson. Wed., 1.30 P.M., Mr. Cairns Forsyth. Thurs., 1.30 P.M., Dr. Perkins; 2.30 P.M., Mr. Bickerton; 3.30 P.M., Dr. Tindal-Atkinson. Fri., 1 P.M., Dr. Lyle Cameron; 2 P.M., Dr. R. J. Perkins; 4 P.M., Mr. Beevor. Sat., 9.30 A.M., Mr. Frankau (Operations). Further particulars can be obtained from the office, 1, Wimpole-street, W. 1.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, March 17th.—10 A.M., Surgical Registrar: Surgical Pathology. 12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen. 2 P.M., Mr. Addison: Surgical Wards.
TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept. 2 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Dr. Scott Pinchin: Medical Out-patients.
FRIDAY.—10.30 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Dr. Burrell: Medical Out-patients. Mr. Sinclair: Surgical Out-patients.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
WEDNESDAY, March 19th.—5 P.M., Prof. E. Gorter, of Leiden: The Pathogenesis of Certain Nutritional Disorders. (University of London Lecture in English.)
THURSDAY.—4 P.M., Dr. Cockayne: Mental Deficiency.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital.
(At 4.30 P.M.)
MONDAY, March 17th.—Dr. S. Cochrane Shanks: The X Ray Examination of Joint Conditions.
TUESDAY.—Dr. F. G. Crookshank: Treatment of Acute Pneumonia.
WEDNESDAY.—Dr. J. Browning Alexander: Pulmonary Fibrosis.
THURSDAY.—Mr. W. E. Tanner: Fractures of the Forearm and Elbow.
FRIDAY.—Dr. Jenkins Oliver: Some Skin Diseases of Infancy and Early Childhood.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: FEBRUARY–MARCH, 1924.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, March 17th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Disseminated Sclerosis: Dr. Birley.
TUESDAY, March 18th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Cervical Rib: Mr. Armour.
THURSDAY, March 20th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., The Neuroses: Dr. Hinds Howell.
FRIDAY, March 21st.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Demonstration of Ward Cases: Dr. Grainger Stewart.
COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, March 17th.—12 noon, Motor Neuron Disease: Dr. J. G. Greenfield.
The fee for the Course, including Pathology, is £5 5*s*. For those who hold Perpetual Tickets the fee is £3 3*s*.
COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, March 19th.—3.30 P.M., The Trigeminal Nerve: Mr. Leslie Paton.
The Fee for this Course alone is £5 5*s*. If taken in conjunction with the general Post-Graduate Course the Fee is £3 3*s*. All applications should be sent to the Secretary, Medical School.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course.
Fees should be paid to the Secretary of the Hospital at the Office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, March 19th.—4.30 P.M., Sir James Dundas-Grant: Cases illustrating the Diagnosis and Treatment of Cancer of the Throat.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
TUESDAY, March 18th.—5 P.M., Dr. Barber: Bacteriology of the Skin.
THURSDAY.—5 P.M., Dr. Sibley: Malignant Disease. (Chesterfield Lecture.)

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, March 18th.—4.15 P.M., Dr. A. E. Barclay: The Large Intestine from the Radiological Point of View.

ANCOATS HOSPITAL LECTURES.
THURSDAY, March 20th.—4.30 P.M., Dr. W. J. S. Reid: Rheumatism of Venereal Origin.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, March 17th.—(At the Hospital for Women.) Dr. Willett: The Pelvic Peritoneal Crisis.
TUESDAY.—(At the Maternity Hospital.) Dr. J. W Burns: The Bleedings of Pregnancy.
WEDNESDAY.—(At the St. Paul's Eye Hospital.) At 3 P.M. Mr. Hayward Bywater: Glaucoma.
THURSDAY.—(At the St. George's Skin Hospital.) Dr. Barendt: Skin Cases.

Appointments.

DOWNING, ETHEL, M.R.C.S., L.R.C.P. Lond., has been appointed House Surgeon to the New Sussex Hospital for Women and Children, Brighton.
MACDONALD, J. B., M.B., Ch.B. St. And., Resident Medical Officer, East Poor House and Hospital and Ashcliffe Children's Home.
SMITH, H., M.R.C.S., L.R.C.P. Lond., Police Surgeon under the Leeds Corporation.
WILLIAMS, ENID A., L.R.C.P. & S. Edin., L.R.F.P.S. Glasg., D.P.H., Resident Medical Officer, Wolverhampton Poor-law Institution.
WOLFERSTAN, K., M.R.C.S., L.R.C.P. Lond., Certifying Surgeon under the Factory and Workshop Acts for Crewkerne.

Vacancies.

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road, Greenwich, E.—H.S. £150.
Barbados General Hospital.—Jun. Res. S. £250.
Bradford City.—Bacteriologist and Pathologist. £750.
Bradford Royal Infirmary.—Three H.S.'s. H.P. Each £150.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.
Burntwood, near Lichfield, County Mental Hospital.—Med. Supt. £1000.
Burton, Derbyshire, Devonshire Hospital.—Asst. H.P. £150.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—H.S. £100. Jun. H.S. £50.
Charing Cross Hospital, W.C.—Asst. Obstet. P.
Chester Royal Infirmary.—Asst. H.S. £150.
Coventry and Warwickshire Hospital.—Res. H.S. £150.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—Morning Cas. O. £120.
Evelina Hospital for Children, Southwark, S.E.—H.S. and H.P. Each £160.
Federated Malay States, Central Mental Hospital.—Asst. Med. Supt. £616.
Greenwich, Dreadnought Hospital.—H.S. and H.P. Each £150.
Hastings, Royal East Sussex Hospital.—Secretary. £500.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. £50.
Infants Hospital, Vincent-square, Westminster.—Jun. Anæsthetist.
Kensington Board of Guardians, Marloes-road Hospital.—Temp. Asst. M.O. £7 7*s.* weekly.
Leicestershire and Rutland Mental Hospital, Narborough, near Leicester.—Second Asst. M.O. £350.
Liverpool Eye and Ear Infirmary.—Hon. Pathologist and Hon. Asst. Aural S.
London Lock Hospital, 91, Dean-street, W.—H.S. £200.
Manchester Royal Infirmary.—Hon. Asst. Aural S.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Asst. S.
Prince of Wales's General Hospital, Tottenham, N.—Two H.S.'s. H.P. Each £150. Jun. H.S. and Jun. H.P. Each £110.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Pathologist. £300. Also Asst. S.
Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. £250.
Rochdale Infirmary and Dispensary.—Jun. H.S. £200.
Rotherham Hospital.—Jun. H.S. £150.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. P.
Sheffield Royal Hospital.—Res. Surg. O. £200.
Warrington, Lancashire County Mental Hospital, Winwick.—Asst. M.O. £440.
West London Hospital, Hammersmith-road, W.—One H.P. and Two H.S.'s. Each £100.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Non-Res. H.S.'s. £150 and £100 respectively.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at King's Lynn, Norfolk.

Births, Marriages, and Deaths.

BIRTHS.

PARIS.—On Feb. 6th, at Quetta, India, the wife of Major R. C. Paris, R.A.M.C., of a daughter.
SUNDERLAND.—On March 3rd, at 1D, Hyde Park-mansions, London, N.W., the wife of Arthur Sunderland, M.R.C.S., L.R.C.P., of a daughter.

MARRIAGES.

BARLOW—ROWNEY.—On March 4th, at St. Bartholomew-the-Great, Smithfield, Dr. Albert Malcolm Barlow to Dr. Eileen Susan Pears Rowney.

DEATHS.

BROAD.—On March 8th, at The Sanatorium, Cardiff, Major B. W. Broad, M.B., C.M., Medical Superintendent.
DAVIES.—On March 8th, at Bryn-Newydd, Sketty, Glamorgan, David Arthur Davies, M.B. Lond., J.P., aged 75.
HAMMOND-SMITH.—On March 4th, at St. Albans-mansions, Kensington-court, W., Henry Hammond-Smith, L.R.C.P., M.R.C.S., aged 73 years.
LAWRENCE.—On March 8th, at Chepstow, Arthur Garnons Lawrence, M.D., in his 88th year.
NEW.—On the 9th March at a nursing home, of pneumonia, John Sherwood New, M.B., B.S., D.P.H., aged 53, Medical Officer of Health for Amersham, Bucks; Physician in charge Stoke Newington and St. Pancras Infants' Welfare Centres. Funeral from 245, Knightsbridge, S.W. 7. No flowers.
NEWBOLT.—On March 9th, suddenly, at his residence, 5, Gambier-terrace, Liverpool, in his 61st year, George Palmerston Newbolt, C.B.E., F.R.C.S., dearly loved husband of Lila Newbolt.
PARK.—On March 8th, at Rosedale, Torquay-road, Paignton, David Scott Park, J.P., F.R.C.S. Edin., &c., in his 80th year.

*N.B.—A fee of 7*s.* 6*d.* is charged for the insertion of Notices of Births, Marriages, and Deaths.*

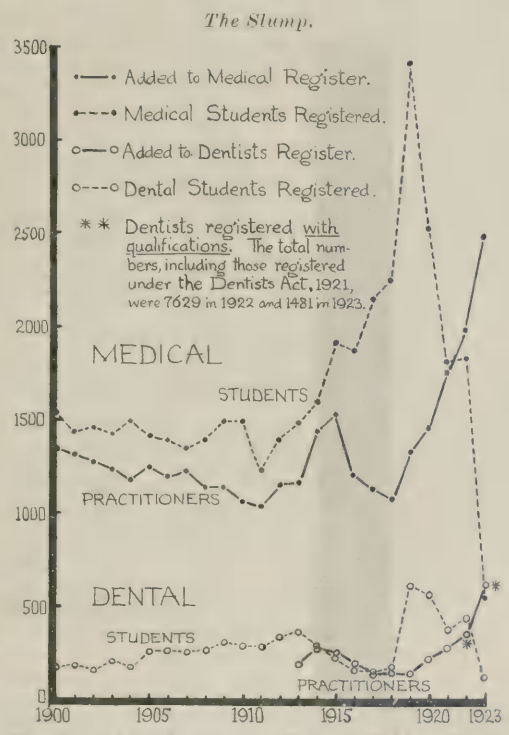
Notes, Comments, and Abstracts.

THE PORTAL OF MEDICINE.

ENTRIES OF STUDENTS AND PRACTITIONERS IN 1923.

In his presidential address to the General Medical Council in August, 1921, Sir Donald MacAlister pointed to the high tide of registration for medical study and expressed a misgiving whether the position had not been reached in which danger might arise to professional education, and perhaps to professional careers, from the mere number of students entering. That danger exists no longer, for the phenomenal rise in the entry of 1918–20 has been followed by a decline in numbers, alike without precedent. From the Medical and Dental Students Register, to which allusion was briefly made last week, it appears that the entry of medical students for 1923 was less than one-third of the entry for 1922. The same is true of the dental students except that a precedent for the small number can be found in 1887 and preceding years. The Medical and Dental Registers, on the other hand, show high-water marks in 1923 for professional registration, and these figures are likely to be maintained for another year or two. The accompanying graph based upon these figures sets out the situation and

The Slump.



The stippled band represents the period of hostilities, 1914–1918.

gives occasion for thought. While the drop in medical and dental entries may be nothing more than the trough succeeding the wave of the immediate post-war years, it must be due in some measure to the lessened entry of women students in particular. The latest report of the University Grants Committee—namely, for the year 1922–23—already shows a diminution of medical students to the number of 32 men and 246 women. Moreover, judging by the Christian names in the G.M.C. list of students, there are hardly more than 60 women among the total 545 medical entrants of 1923. The Grants Committee's report calls attention to the reasons which served to draw young men and women after the war to the medical schools and departments, but it does not foreshadow any such tremendous reduction in the entry as is shown by the 1923 figures. The diminution may have its root in economic conditions; possibly in a belief among parents that the medical profession is likely to be overcrowded or does not present a fair prospect of livelihood. No doubt the relatively high cost of the medical curriculum is a contributing factor.

CENTENARY OF THE GLASGOW EYE INFIRMARY.

THE Glasgow Eye Infirmary began its work, albeit humbly, in June, 1824, and it will thus attain its majority, as one may say, in June, 1924. The founding of an eye hospital in Glasgow was first conceived by Dr. William Mackenzie, who circulated locally in January, 1824, a small pamphlet calling attention to the need for such an institution in the City, and he received enthusiastic support from another Glasgow surgeon, who had already established a considerable reputation in ophthalmology—Dr. George C. Monteath. After various preliminaries it was decided, at a public meeting with the Lord Provost in the chair, that an eye infirmary based on Dr. Mackenzie's suggestions should be established. The result was that a small house in a rather obscure lane almost in the centre of the city was opened in June, 100 years ago, for the care and treatment of sufferers from eye diseases.

The first surgeons were, as was to be expected, Mackenzie and Monteath, and it was arranged that each should take duty for a period of three months at a time and should attend at the infirmary three days a week. At first there was no special provision for operative treatment; the surgeons attended patients at their own homes and performed such operations as were needful there. In 1825 two beds for indoor patients were provided and a man and his wife were employed as nursing attendants. Subsequently two additional beds were supplied. In 1834 the premises at 19, Inkle Factory-lane (off North Albion-street) became too small and a house at 14, College-street (off High-street) was purchased. In this house ten patients could be accommodated, and the nursing staff remained as it was. In 1851 the work had increased to such an extent that premises of a better type became essential and the house in Charlotte-street was purchased. By 1874 continued growth had necessitated a further removal to the present buildings in Berkeley-street, and in 1886 an addition to the premises was completed.

There is now indoor accommodation for nearly 110 patients at Berkeley-street, as well as an out-patient department at which about 22,000 new patients attend each year. There is also an out-patient department in a new building erected in 1897 at Charlotte-street, where about 4000 new patients attend yearly. A branch of the eye infirmary has been opened at Clydebank for outdoor treatment of patients who reside in the neighbourhood of the shipyards and other works in that district. Thus the work began by Mackenzie has grown from small beginnings to very considerable proportions. The statistics of the Glasgow Eye Infirmary show that the amount of work done is great and it may be said that the state of the funds of the institution indicates that, after a hundred years of service, the public of the city recognises its merits.

Two or three little points in medical history may be noted. Tenotomy for squint was first performed in 1840 and depression for cataract was last performed in 1849. The epidemic of relapsing fever which raged in Glasgow about 1853 has left its mark in the statistics of the infirmary. Lastly, it is striking how great a decline there is in the proportion of cases of ophthalmia neonatorum to the total number of new cases. In 1840 it was nearly 1 in 10 and it gradually declined to 1 in 500.

In view of the celebration of the centenary a committee has been appointed to consider what form of memorial would most fittingly mark the occasion.

A MEDICAL ACCOUNT BOOK.

WE have received a copy of Henry's Account Book,[1] which is designed for the use of members of the medical profession. If one is prepared to give the necessary time or attention to filling it up it will simplify many common difficulties and satisfy queries raised by the inspector of taxes. Whilst the headings used are suitable for ordinary purposes others might be required, and a little space more for extra blank columns would have been an improvement. This account book will be of value to medical men.

PUBLIC HEALTH IN BRITISH HONDURAS.

THE estimated population of this colony on Dec. 31st, 1922, was 45,717 (males 22,688, females 23,029). The birth-rate for the year 1922 worked out at 39·059 per 1000, as compared with 35·456 in 1921, and the death-rate was 30·752 per 1000, as against 24·507 in the previous year. There was an alarming rise in the number of infant deaths. This was partly accounted for by an epidemic of whooping-cough. In the Orange Walk and Corozal districts the disease was very prevalent, and was of a virulent type, no less than 80 deaths in Corozal and 25 in Orange Walk having been certified as occurring from it. There were registered during the year in Belize (the capital) 9 deaths from malaria, the average mortality for the previous four years having been 12. The morbidity from this disease, which is naturally more difficult to estimate accurately, is, according to most of the medical practitioners in the town, on the decrease—a fact due probably to the increased precautions in carrying out the Mosquito Destruction Ordinance and the more efficient cleaning of yards. Two deaths were registered from tetanus neonatorum, as against an average mortality of 4 during the previous four years. It is hoped that, the new type of trained midwife now gradually taking the place of the older generation in Belize, this disease may before long be completely eradicated. Deaths from malaria showed a proportion of 6·7 per cent., from tuberculosis of 9·2 per cent., and from broncho-pneumonia of 10·6 per cent. of all the deaths registered. The climate of British Honduras has the reputation of being very unhealthy, but facts show that it compares not unfavourably with that of other tropical countries with small European populations, and that Europeans leading a normal life and taking common precautions find it pleasant and healthy. The highest rainfall registered in 1922 was at Punta Gorda in the Toledo district, which had a total of 151·19 inches and 192 days on which rain fell. The lowest rainfall was at Corozal, which had a total of 27·10 inches. The hottest day was May 14th, on which the thermometer registered 93·5° F., and the coldest day Jan. 14th, when it registered 56° F.

[1] Compiled by Mr. D. H. Rosen, 122, St. George's-road, Bolton; and printed by Messrs. Abel Heywood and Son, Manchester.

FOR THE ASKING.

To the Editor of THE LANCET.

SIR,—May I ask through the medium of your columns whether a gift of three pairs of silk elastic stockings in quite good condition, though not new, would be useful either to an institution or to anyone interested in a deserving case? They were made to fit a female of middle height, and I should like to feel that they had gone where they were useful.

I am, Sir, yours faithfully,

March 11th, 1924. STOCKINGS.

THE PROTECTION OF AIRCRAFT FROM INSECTS.

AN admirable little book,[1] illustrated with figures borrowed from well-known text-books, and designed for the use of officers and other Government servants in East Africa, has reached us. The subject-matter deals with tropical disease and insect transmitters and is clearly and well expressed: the instructions are direct and dogmatic. The second portion, written for the guidance of airmen in this country, describes the various kind of wood-boring insects liable to damage the wooden portions of an aeroplane and the means that should be taken to protect machines from this damage in East Africa. A useful map showing the range of tsetse-flies in the country is inserted at the end of the book.

M. L. J.—The remuneration of the locum-tenent is much the same now as it has been for some years past. In an average practice, whether in town or country, the lowest fee for a trustworthy tenent is 8 guineas a week, plus board, lodging, and travelling expenses. In the case of unusually large practices or in colliery or manufacturing districts 10 guineas may be paid. Advertisements offering services at less than the standard rate should be scrutinised with care.

[1] Hygiene and Disease in Eastern Tropical Africa—The Protection of Aircraft from the Attacks of Insects. Issued as a supplement to the handbook of German East Africa. Prepared on behalf of the Admiralty and the War Office. London: His Majesty's Stationery Office. 1923. Pp. 58. 2*s*.

Lettsomian Lectures

ON THE

TREATMENT OF PULMONARY TUBERCULOSIS.

Delivered before the Medical Society of London

BY R. A. YOUNG, C.B.E., M.D., B.Sc., F.R.C.P. LOND.,

PHYSICIAN TO THE MIDDLESEX AND BROMPTON HOSPITALS.

LECTURE III. (*Delivered on March 17th.*)

METHODS OF SECURING LOCAL REST FOR THE LUNG.

THE established value of rest as a cardinal factor in the treatment of pulmonary tuberculosis rendered it fitting that attempts should be made to secure more complete rest to the affected lung than that afforded by simple recumbency. The success of strict local rest in the treatment of tuberculosis of the bones, joints, and spine offered also a direct incentive to attempts to achieve similar conditions for the pulmonary lesions. In this lecture I propose to consider the methods which have been devised to this end, with special reference to the indications for their application, their present limitations, and contra-indications. In this connexion it is well to remember that opinion is still in the making, and that with greater experience and with improved methods these forms of treatment may well prove to be of wider application by affording help to cases for which at present they seem unsuitable. This much may even now be affirmed, that they represent a real advance in treatment, that they have given help to cases in which other methods have failed lamentably, and that they have been the means of prolonging many lives and of restoring to active and useful life not a few patients whose outlook was at best one of chronic invalidism. It is much to be regretted that in this country, in which the original suggestions of several of these methods of treatment originated, they have been somewhat neglected until recently. There is now, however, gratifying evidence that their value is being widely recognised here, and they are now taking a recognised place in the scheme of treatment of this disease largely owing to the work of Lillingston, Pearson, Morriston Davies, Riviere, and Burrell. The recent report on artificial pneumothorax of Burrell and MacNalty, published by the Medical Research Council, is a very valuable analysis of the present state of this form of treatment, and a recent number of *Tubercle*[1] contains a valuable summary of the present position of thoracic surgery. To both of these publications I must here acknowledge my great indebtedness.

At the outset it may be well to stress the importance, indeed the absolute necessity, of X ray control of all methods directed to securing local rest to diseased lung tissue. Some years ago I asked Dr. Rist of Paris why it was that he found so many more cases suitable for artificial pneumothorax treatment than most British physicians. He replied that it was because he used X rays more than we did. As far as possible every case of active tuberculous disease of the lung should be examined with the X rays, and particularly all those not responding satisfactorily to ordinary methods of treatment. This examination may reveal the suitability of the case for these special methods of treatment, or demonstrate almost conclusively their impracticability. While these treatments are in progress X ray control is also of the greatest assistance.

1. SIMPLE MECHANICAL METHODS.

In cases where strict rest in bed fails to render the patient afebrile, attempts may be made to limit the respiratory movements of the affected lung, or even of the diseased part of the lung, by mechanical means such as by belts and strapping. This method was originally employed by Dr. F. T. Roberts in the treatment of painful pleurisy. He applied strapping to the affected side in a manner similar to its application in the immobilisation of fractured ribs. Various ingenious mechanical contrivances have been employed to restrict the movements of the affected side or of that part of the affected lung which is known to be most diseased. Application of sand-bags in such a way as to obstruct the movement of one side of the chest is sometimes employed. At Frimley we sometimes use an "apex belt" to lessen the excursion of the upper part of the chest. Dr. Wingfield has recently employed strapping in broad strips, applied with considerable force so as very effectively to limit the movement of one side of the chest. The strapping has necessarily to be reapplied when it slips to such an extent as to allow more movement again. Dr. S. H. Stewart[2] has devised an ingenious lung splint which he has used for the same purpose.

Recently Dr. S. A. Knopf[3] has claimed that what he describes as "rest breathing" is a useful adjunct to treatment. He maintains that animals which breathe slowly live longer and are less susceptible to tuberculosis than those breathing more quickly. He believes that "in controlled diaphragmatic breathing, aided, if necessary, by slight mechanical restrictions, we have the best substitute for artificial pneumothorax, particularly where the tuberculous lesion is limited to the upper portion of the lungs." He instructs the patient to breathe slowly and to use the diaphragm chiefly. He has found that the number of expirations can be reduced from 20 per minute to ten or less, with great advantage to the patient.

None of these methods should be persisted in if they increase pain or lead to cough and dyspnœa. They are often impracticable if there is emphysema. Knopf allows that his method is not to be used if there is great involvement of the lower lobes.

2. ARTIFICIAL PNEUMOTHORAX.

Mechanical methods such as those just described can at best only restrict the movement of the affected lung and limit the respiratory ventilation of that side. In some cases this restriction may be sufficient to quieten if not lessen the circulation through the diseased areas and to prevent absorption of toxic products. When these areas of disease are extensive and active these methods often fail and the case becomes an unfavourable one, involving very prolonged rest before quiescence is achieved or active spread with progressive deterioration and eventually death. To such cases artificial pneumothorax when practicable offers a further chance of improvement and arrest. The suggestion for its use in pulmonary disease is over a hundred years old, and is due to Dr. James Carson, of Liverpool. It was again suggested by Forlanini in 1882, and carried out by him in 1888, so that he must be regarded as the pioneer of this form of treatment, though it had been employed in France by Potain in 1884 to replace fluid in a hydro-pneumothorax. Cayley in 1885 had a pneumothorax induced by incision to endeavour to stop severe hæmoptysis. Murphy of Chicago used this form of treatment in 1898. Brauer improved the technique and added the water manometer to the apparatus for induction of the pneumothorax, thereby greatly lessening its risks.

Artificial pneumothorax was first used in this country by Lillingston in 1910, and next year cases were recorded by him and by Colebrook, Pearson, and Rhodes. It is now recognised as a valuable routine treatment for suitably selected cases by most workers in this country, and it is important that the indications and contra-indications for its employment should be more widely known.

[1] Tubercle, October, 1923, p. 1.

[2] Brit. Med. Jour., 1923, i., 414.

[3] British Journal of Tuberc., 1923, xvii., No. 3.

Rationale of the Treatment.

Artificial pneumothorax treatment aims at allowing the lung to collapse by admitting sterile air, oxygen, nitrogen, or other gas into the pleura. The lung collapses in the first instance by its own elasticity, this being no longer controlled by the negative pressure in the pleural space. It is obvious that when this elastic recoil of the lung is complete the pressure in the pleura should be that of the atmosphere and that any further introduction of gas into the pleura will raise the pressure to a positive level, with the result that the lung will be subjected to a compressing force. It must also be borne in mind that these readjustments of the intra-pleural pressure involve alterations in the mediastinum, which is at first drawn to the opposite side till the pressure becomes zero, and afterwards pushed over to it, when the pressure becomes positive. The importance of manometer readings of these pressures is therefore apparent. They are further essential as affording the best means of determining when the needle is in the pleural space and when the air or gas may safely be allowed to pass into this space. In the induction of a pneumothorax the object is to get the lung to collapse by its own elasticity, and it is unnecessary and undesirable to introduce a large amount of gas at the first sitting or to obtain zero or atmospheric pressure, still less a definite positive. It is only later, when the question of incomplete collapse from adhesions or insufficient gas entry becomes apparent, that the question of increased pressure becomes important. It must be remembered that as in spontaneous pneumothorax, the altered pressure relations may lead to dyspnœa, pain, restlessness and cardiac embarrassment, and the onset of any of these symptoms during the treatment demands careful investigation. An excessive pressure may lead to the condition of mediastinal bulge or hernia, whereby the distended pleura transgresses the mediastinal area and appears as a definite projection towards the sound side. This is to be avoided if possible. In cases of incomplete collapse in which attempts are made to stretch or break down adhesions by gradual increase of pressure, failure often occurs, and the increased gas put in may lead to mediastinal bulge instead of to further lung compression. The present tendency is against high pressures and against attempts to break down adhesions by this means as not being devoid of risk. These points illustrate and emphasise the importance of X ray control of the treatment.

This form of treatment may also serve the very useful purpose of allowing lung tissue which is the site of an excavation to contract, thus reducing the cavity and promoting healing and fibrosis. In like manner it may be of value in severe hæmoptysis by contracting the lung tissue around the aneurysm or vessel from which the hæmorrhage comes.

It might be expected if there were active lesions in the opposite lung that they would become more active owing to the increased work thrown upon this lung. This, in point of fact, does occur, if there are extensive lesions present, and may necessitate abandonment of the treatment after it has been started. Where the lesions are localised and of comparatively slight activity, however, there may be a definite beneficial effect and these lesions may progress satisfactorily to arrest. This may be due to increased vascularity of this side, which has been supposed to occur, or to a cessation of focal reactions owing to the prevention by the collapse produced, of auto-inoculations from the more diseased side.

Indications and Contra-indications.

In spite of its great and well-established value artificial pneumothorax is not a form of treatment to be lightly applied. Every case must be considered from many aspects to determine whether the treatment is likely to benefit the patient and to improve his chances of recovery. The actual indications are still subject to discussion, though there is general agreement as to most of them. It is most suitable for patients in whom the disease is confined to one lung or in whom, if bilateral, there are only localised or slightly active lesions on the side less involved. It is difficult to lay down a standard as to what extent of disease in the second lung renders the operation likely to fail. Each case must be considered as an individual problem, after careful review of the symptoms, the signs, the X ray findings, the physique, and the general condition of the patient, with special reference to the condition of the circulatory system.

These conditions being fulfilled we may consider artificial pneumothorax (1) in cases in which, in spite of treatment in a sanatorium or on sanatorium lines the disease is obviously active and spreading and there is fever, with cough and expectoration or signs of caseation. The question as to how long ordinary treatment is to be persisted in is a difficult one, and no hard-and-fast rule can be made. Dr. Burrell suggests that the treatment should be considered in any such patient who shows signs of activity after six months' medical treatment. On the other hand, it may jeopardise the chances of complete success if the decision is unduly postponed, and where the clinical signs and the radiographic examination indicate failure to secure arrest, the treatment should be started much earlier. (2) In cases with repeated severe hæmorrhages this form of treatment is of great value, and it offers a means of dealing effectively with the cause of the hæmoptysis. It may also be considered in cases of severe and prolonged hæmorrhage, which do not yield to the ordinary methods of treatment. (3) In patients who settle down and become afebrile under sanatorium treatment, but are left with cavities and with more or less copious expectoration containing tubercle bacilli. (4) In patients who are afebrile while in bed or while on restricted exercise, but who get auto-inoculations or become slightly febrile on attempting to work. (5) Cases with marked basic signs or with bronchiectasis, though pleural adhesion often renders it impracticable.

The contra-indications are more explicit, although it is possible that with increasing experience and modified methods some cases which are at present regarded as absolutely unsuitable may prove to be capable of benefit. The main contra-indications fall into two groups: (1) those due to the disease; (2) those due to the physique, temperament, and general medical state of the patient. To the first group belong (*a*) cases with active disease in the opposite lung, and this is absolute if it involves more than one-third of its extent; (*b*) if there are severe complications, such as tuberculous enteritis or bilateral renal tuberculosis. Laryngeal tuberculosis does not negative its employment unless it is very advanced. In the second group we may include (*a*) cases with poor physique, ill-nourished, and gravely debilitated; (*b*) those with feeble circulation, rapid pulse, and very low blood pressure; (*c*) severe visceroptosis is regarded by Dr. Burrell as a contra-indication; (*d*) cases complicated by other diseased conditions, notably diabetes, chronic nephritis, asthma, and advanced emphysema; (*e*) in patients over 60 (Lillingston); (*f*) both Burrell and Lillingston would exclude patients of highly neurotic tendency or with mental instability.

There remains a number of cases which are doubtfully suitable, in which the decision would depend upon the predilection and experience of the practitioner in charge. Among these we may include—

(*a*) *Early Cases.*—A few authorities regard early cases as suitable. The arguments against this have been well expressed by Dr. Clive Riviere in his book on this form of treatment. It is unnecessary in early cases which respond to sanatorium, climatic, or other medical methods within reasonable time, and since it involves some risks, which though small are not negligible, the balance seems to be against its employment in such cases. Moreover, the time it needs to be kept up and the necessary inconvenience it imposes

n the patient would hardly warrant its use as a primary method of treatment.

(*b*) In *acute cases*, especially if of broncho-pneumonic ype, its employment is more than doubtful. The isease is generally widespread and bilateral and ts progress rapid. Artificial pneumothorax is either napplicable because of the extent or if tried it usually ails. In the localised lobar pneumonic type of case may be tried cautiously if the opposite lung is not nvolved, if the general condition is good, and the ulse is not rapid.

(*c*) *Bilateral Cases.*—The question of bilateral neumothorax must be considered separately. It as been shown to be practicable, but it is still on its rial.

Technique of Artificial Pneumothorax.

The apparatus consists essentially of (1) a special eedle for puncture of the pleura. The form introuced by Dr. Clive Riviere is that usually employed or the primary induction, as being safer, owing to s blunt rounded end, while the sharper pointed needle f Saugman is used for refills. It is best to have a nall piece of glass tubing connected to the needle s in an ordinary paracentesis needle, so that blood r fluid may be seen if the needle enters a vein or a leural effusion. (2) A reservoir containing sterile r, oxygen, or other gas, generally a bottle connected ith a second bottle containing water, with arrangeents for adjusting their levels so that air or gas n be displaced from the reservoir by slight pressure. 3) A manometer containing coloured water, spirit, bromoform. (4) A three- or four-way glass tube ith rubber tube connexions to the reservoir, the anometer and the needle, each of which is controlled y a spring clamp. The fourth branch present in me forms is simply to allow of filling and cleaning. everal convenient forms are on the market, notably iat of Dr. Lillingston and Dr. Pearson, which is mple and portable. Dr. Parry Morgan recommends ie use of two manometers, and has designed a ecial form of apparatus with this feature. A simple rm is that used by Dr. Marshall, in which the gas contained in a rubber bag. It has the disadvantage at the quantity of gas introduced cannot be easured, nor can the pressure at which it enters observed.

The apparatus should be thoroughly tested before e to see that all connexions are correct and that l joints are air-tight. The tubes having been sterilised eviously, strychnine, ether, pituitrin, and a sterile ringe should be ready in case of shock or any other nergency.

The preparation of the patient and the actual chnique of the procedure are well described by . Burrell in the report to which I have already ferred, and in most of the cases in which I have ployed the treatment it has been carried out her by Dr. Burrell at Brompton Hospital or by . R. C. Wingfield at Frimley. Usually the tients to whom the treatment is applied are already afined to bed, but in any case they should be put bed till the pneumothorax is well established or til the temperature has subsided to normal. An erient the night before is desirable, and an injection morphine gr. ¼ or an equivalent dose of omnopon lf an hour before the operation. The patient should on the sound side, comfortably supported, with the e of the proposed puncture conveniently placed the operation. The favourite site for induction in the mid-axillary line in any space from the th to the ninth, though if failure results here trial y be made in the posterior axillary line, at the se behind, or in the second space below the clavicle, ough it is wise not to make more than two attempts one day, and Dr. Burrell states that four failures different situations render it unlikely that the atment is practicable. The skin having been nted with iodine, a 2 per cent. solution of novocaine h a little adrenalin is used to anæsthetise the skin l tissues down to the pleura, the skin being first dered insensitive by an intracutaneous injection, a point being selected slightly above the interspace where it is intended to insert the Clive Riviere needle. The skin now being insensitive, it is drawn down slightly so as to be over the selected spot, and then the needle is again inserted and pushed down gradually to the pleura, the remainder of the novocaine and adrenalin is slowly injected—2 c.cm. in all being used. The Clive Riviere needle attached to the apparatus is then dried in a spirit flame and inserted down to the pleura, the trocar is withdrawn, the tap on the needle is closed, and the cannula pushed through into the pleural space. If the clamp compressing the manometer connexion is not open it is released and the pressure changes are noted. If the cannula is in the pleura negative-pressure oscillations, varying with inspiration and respiration from 0 to −10 cm. or more, are apparent, and it is then safe to allow the air or gas to enter the pleura. The current teaching is now to introduce about 300 c.cm. at the first induction, taking careful note of the effect of this amount on the pressure readings, which are usually made a little lower, generally by about 2 cm., but which should remain negative. The needle is then withdrawn and the skin is again painted with iodine, but no dressing is necessary.

Refills and Pleural Pressures.—The sequence of the refills, the amount of air or gas introduced, and the pressures obtained are all matters requiring care, and each must be adapted to the individual case if success is to be achieved. There is no object in trying to secure rapid collapse except in dangerously severe hæmorrhage. The general rule now is only to introduce about 300 c.cm. at the induction, or such an amount as to lessen the negative pressure about 2 cm. of water. A small amount of air is less likely to cause distress to the patient, less calculated to lead to a febrile reaction from increased absorption of toxic products, and less liable to force infected secretions into other parts of the lung. If no reaction develops the first refill is generally given next day, but if there has been much rise of temperature it is well to wait till it has subsided. The amount given varies—400 c.cm. or more being introduced, or enough to lessen the negative pressure 2 or 3 cm. of water. Two days may then elapse before the second refill, three days before the third, and then longer intervals up to a week, but no definite rules can be laid down. Dr. Burrell has recently published a valuable note [4] pointing out that the object to aim at is to secure and maintain effective collapse. He tries to obtain this collapse in about a fortnight by means of five or six refills. He then endeavours to determine the optimum degree of collapse for the individual case—that is, collapse which is sufficient to keep the lesions at rest. The spacing and the amounts he determines by X ray control if possible, or by careful watching of the temperature and of the symptoms when it is not available. Refills should be given often enough to prevent the lung from re-expanding as seen by the X rays and to obviate any return of fever, or of cough and expectoration. As a rule, by the end of the first month the weekly interval may be increased to ten days, then to 14, and so on gradually to three weeks. For the remainder of the first year refills are usually necessary at intervals of three or four weeks. During the second year longer intervals may become possible, such as six weeks, and after this as long as two months. These intervals must, however, depend upon the degree of collapse and upon the rate of absorption of the gas introduced. It should be borne in mind that permitting the lung to expand by allowing too long intervals not only lessens the effectiveness of the treatment, but also tends to lead to adhesions, and thus to bring the treatment prematurely to an end. The amount it is necessary to introduce is again an individual factor and may vary from 400 to 800 or even 1000 c.cm. according to the interval, the degree of collapse, and the pressure it is desired to obtain.

[4] Brit. Med. Jour., 1924, i., 368.

The question of the intrapleural pressures to aim at is also an individual problem. There has been recently a change in the general rule in this matter. Few people now aim at securing a high positive pressure. It has been shown that effective collapse may in some cases be maintained throughout by a pressure below the atmospheric—that is to say, one still negative. On the other hand, in some cases it may be necessary to raise it considerably to secure collapse, and this may be possible without causing severe discomfort to the patient.

Selective Collapse.

The observation of cases with the X rays and the use of lower pressures have brought to light an interesting fact—viz., that in partial collapse the air introduced tends to accumulate more especially over the diseased area if this is localised and if the pleura is not adherent over it. This phenomenon is known as "selective collapse," and it is believed to be due to the changes in this area rendering it more susceptible to pressure variations. Parry Morgan some years ago suggested that this might occur, but its occurrence was established by Barlow and Kramer.[5] This selective collapse has been put forward as a plea for the use of lower pressures in pneumothorax treatment by Hennell and Stivelman. They suggest that positive pressures are only necessary where there are adhesions, a fixed mediastinum, active thick-walled cavities or extensive disease in all the lobes of the affected lung. The importance of selective collapse, which is an observation it is easy to confirm, is that it affords a hope that some form of partial collapse therapy may be practicable where there is localised disease, and that it may be possible to permit some parts of the diseased lung to function during treatment.

Bilateral Pneumothorax Treatment.

Various cautious attempts have been made to carry out this form of treatment in chronic cases with bilateral disease. Dr. Parry Morgan and a few other observers have tried it in this country, but there are insufficient data as yet to allow of an appraisal of the procedure. Barlow and Kramer[5] in America have applied the method of selective collapse to bilateral cases, and their paper is well worth study. They advise induction on the more involved side first, but if no such special reason exists, recommend that the left side should be first treated. The second side is not attempted until four or six weeks after the first side has been collapsed. The stereoscopic X ray photographs are examined after a refill to see that there is no over-inflation of this side. A few days are allowed to elapse, then 100 or 150 c.cm. are cautiously introduced into the opposite pleura and one or two refills of about the same amount are given on alternate days before the original side is again refilled. The subsequent refills depend upon the progress of the case, the effect of the inflations and degree of dyspnœa and discomfort induced. It is obvious that this form of treatment should not be tried indiscriminately, and at present it is of very limited application.

Duration and Termination of the Treatment.

The time for which the collapse treatment should be maintained is a difficult question to determine. Here, again, there can be no general rule. Most observers recommend that it should be kept up for at least three years. Saugman recommended that it should be terminated in the summer if possible, and that the treatment should be resumed if any symptoms of relapse became apparent. Most authorities advise that the expansion should be gradual, occasional refills at longer and longer intervals being given. It is important to remember in this connexion that as the lung expands adhesions usually form between the two pleural layers as they resume contact, and a premature termination of the treatment may render its subsequent employment impossible. Where an incompletely effective partial collapse only is obtained the treatment may have to be abandoned, or it may be that owing to increasing adhesions the lung slowly expands even against pressure and the pleural cavity becomes gradually obliterated. In the early stages the treatment should be carried out in a hospital, nursing home, or sanatorium, but after the disease is quiescent treatment may be continued at home, and the patient is often capable of returning to work.

Risks of Artificial Pneumothorax.

Gas Embolism.—The most important precaution is to make certain by the manometer readings that the needle is in the pleura before the gas is allowed to flow in. If the needle has not entered the pleura the readings will remain at zero or show slight oscillation if it is actually in contact with it. If the needle has entered the lung, there is sometimes a negative pressure without proper oscillations. In introducing air it is best to adjust the apparatus beforehand so that the air or gas is at the atmospheric pressure or just below it in order that the first few c.cm. may be drawn and not forced into the pleural cavity. With these precautions the risk of gas embolism is practically excluded. It is worth while to mention that gas embolism has occurred in the course of refills, so that the same strict care is necessary as for the induction.

Another risk is that common to any interference with the pleura—viz., *pleural shock*. It varies from slight faintness and anxiety to sudden and profound collapse or even immediate death. In its graver form it is fortunately rare, but it is always well to be prepared for it. Pituitrin should be at once injected, other stimulants given, hot-water bottles applied, and artificial respiration carried out if breathing has ceased. Though it has most often been observed with the primary induction, it is not unknown in connexion with refills.

Puncture of the lung may occur if there are adhesions and it gives rise to no unpleasant results unless the trocar enters a large vessel, when hæmoptysis may occur, but as a rule this is slight and soon subsides. It should also be suspected if no rise of pressure occurs after a considerable amount of air has been allowed to enter. If there are no adhesions puncture of the lung may lead to spontaneous pneumothorax and to subsequent infection of the pleura, especially if a caseous area or a cavity has been entered, when the result may be very serious. This risk is a very slight one if a Riviere needle be cautiously used for the induction.

Subcutaneous emphysema may occur, particularly if a high intrapleural pressure is produced. It is rendered less likely by the manœuvre of anæsthetising the skin over a rib above the selected interspace and drawing it down over that space when the puncture is made. It can usually be prevented from spreading by a pad and pressure over the puncture. Occasionally subpleural or mediastinal emphysema may occur, the air tracking up the cellular tissue of the neck and there spreading widely in the subcutaneous tissues. This, though unpleasant, is not serious and subsides with rest, though pain, if it occurs, may necessitate the use of morphine.

Complications During the Treatment.

Pleurisy occurs in about 50 per cent. of the cases and goes on to effusion. This is almost invariably serous unless rupture of the lung has occurred or unless the effusion becomes secondarily infected. Investigation of its cytology may show some polymorphonuclear cells in the early stages, or if secondary infection is present, but as a rule there is a marked lymphocytosis. Tubercle bacilli are often present in the fluid in very large numbers. The pleurisy is generally associated with some pyrexia which usually subsides in a few days, though occasionally it persists and is associated with progressive deterioration of the patient's condition owing to activity in the lung lesions. Before the effusion develops there may be malaise and pain. The physical signs are characteristic owing to the shifting dullness, the dead level of the fluid, and the succussion splash. The appearances in X ray examination are also striking owing

[5] American Rev. Tub., vi., 2, p. 75.

the sharp upper level of the shadow in the erect position. The fluid may be slowly absorbed or may remain for months and become converted into a greenish purulent fluid which is sterile except for the presence of tubercle bacilli. If the fluid reaches a high level some of it may be removed and replaced with air and the pressure kept at such a level as to keep the lung collapsed if possible. The patient should remain at rest in bed for some time after the temperature has subsided. Statistics show that the occurrence of simple effusion has very little effect on the end-result. Cases with effusion show nearly if not quite as good a percentage of recoveries as those without.

Purulent Effusion.—A serous effusion may become purulent if it is very chronic, and this may also occur if any marked extension of the pulmonary disease occurs. Purulent effusion may require oxygen replacement from time to time. The more severe forms of pleural infection may lead to great pleural thickening and prevent later expansion of the lung or may lead to increasing adhesion as the fluid is absorbed or withdrawn. If the fluid reaccumulates frequently the pleural cavity may be washed out with some weak antiseptic such as lysoform or with collargol.

Rupture of the lung is a very serious complication and is more likely to occur with positive pressures. It gives rise to a pyopneumothorax with a permanent pleuro-pulmonary fistula. The patients usually become acutely ill directly after the rupture and when pus has formed the pleural cavity may be washed out with antiseptic after aspiration and gas replacement. The condition is usually fatal, but thoracoplasty done in several stages has been successful in a few cases.

Pain, discomfort, and dyspnœa may occur and these may be due to mediastinal displacement. Febrile reactions of varying degree occur in some cases.

Results.

A sufficient number of statistics are now on record to demonstrate the real value of this form of treatment. It has restored to working capacity a large number of patients whose outlook apart from it was grave. It has prolonged life and given comfort to many other cases, and its value is the greater that it is applicable to cases with extensive disease provided that this is mainly unilateral.

3. METHODS OF DEALING WITH PLEURAL ADHESIONS.

The limitations imposed on the efficacy of artificial pneumothorax treatment by adhesions is strikingly emphasised by the statistics of Gravesen.[6] In 211 patients in whom this form of treatment had been attempted by Saugman and himself, he found on investigation, from three to 13 years afterwards, that in those without adhesions, thus allowing complete pneumothorax, no less than 70·2 per cent. were able to work. In cases with localised adhesions rendering the pneumothorax incomplete, only 33·3 per cent. were in this satisfactory state, while in those with more extensive adhesions, only 11·1 per cent. were capable of working. It is interesting to note that the figures for the cases with more or less complete adhesions, rendering pneumothorax impossible, are almost identical—viz., 11·8 per cent.; in other words, artificial pneumothorax is useless where adhesions are widespread.

It was to be expected that these failures would lead to a careful study of the character of adhesions and would stimulate attempts to deal with them. Investigation of X ray photographs, especially of stereo-radiograms, in cases of incomplete artificial pneumothorax reveals the fact that not a few adhesions are string- or band-like in character, others being membranous, while both may be capable of stretching. They can often be seen to drag on the lung and prevent it from collapsing completely. A third kind is the extensive surface adhesion commonly seen at the apex or at the base. This variety, if at all widespread, practically excludes the possibility of artificial pneumothorax treatment, since it is usually over the diseased part of the lung, and it is impracticable or risky to strip up such adhesions surgically.

Attempts have been made to deal with the string- and band-like or membranous adhesions by four different methods. (1) By increased intrapleural pressure. This may be effective on small or recent adhesions, but it is not devoid of risk if high positive pressures are employed. Not only may they cause pain, tightness, and dyspnœa, but there is also the risk of rupture of the lung with subsequent pyopneumothorax. Moreover, a mediastinal bulge or hernia may occur and increase in pressure may even lead to its rupture rather than to stretching or tearing of the adhesion. (2) By introducing a special tenotome through the chest wall, under careful local anæsthesia, and cutting the adhesion under control of the X rays, the adhesion being rendered taut by suitable increase of pressure of the intrapleural gas (Morriston Davies). The uncertainty of this method and the risk of hæmorrhage render it unsuitable for general use. (3) In more extensive adhesions the pleura has been opened through an intercostal space to allow of the adhesions being ligatured and cut. Post-operative hæmorrhage and empyema have been observed after this method and it seems to involve more risks than are commensurate with its advantages. (4) The procedure introduced by Jacobaeus seems the method of choice where practicable. A thoracoscope made on the principle of a cystoscope is introduced into the pneumothorax cavity through a cannula inserted usually in the posterior axillary line, the position chosen being that most convenient for observation of the adhesions. If these seem suitable for division a galvano-cautery is introduced through a second cannula, which has been inserted through an intercostal space in such a position as best to allow of dealing with the adhesions. This is usually in the anterior axillary line in the seventh, eighth, or ninth space for adhesions high up, or in a lower space for those near the diaphragm. The development of smoke in the pleural cavity may delay the completion of the operation, but can usually be dealt with satisfactorily. Jacobaeus has been successful in 75 per cent. of his cases, while Holmboe[7] and Gravesen [8] report favourably of its use. Piguet and Giraud [9] at Leysin write enthusiastically of its value, and it has been employed in several cases in this country. The operation can be done under local anæsthesia, and the risks involved are not serious if due precautions are taken. They comprise (1) hæmorrhage, which is usually avoided by using the cautery at a dull-red heat. (2) The lung may be opened owing to pulmonary tissue being prolonged into the adhesion by traction. If a cavity be opened in this manner it may lead to pyopneumothorax. This can usually be avoided by dividing the adhesion as near the chest wall as possible. (3) Pleural effusion sometimes results, but as in ordinary artificial pneumothorax cases, it does not, as a rule, interfere with the satisfactory progress of the case. (4) Surgical emphysema and temporary fistulæ may result from the puncture wounds, but are not serious. The method should be strictly limited to cases with string- and band-like adhesions, and a severe selection should be exercised as to the suitability of these. It is probable, therefore, that the number of cases to which it can be applied will be comparatively few. None the less, in experienced hands it represents a real addition to our means of treatment and we should carefully consider it in certain cases.

4. PHRENICOTOMY.

Theoretically section of the phrenic nerve on the affected side might be expected to be of value in securing rest to the lung, and it is claimed by some that this procedure alone reduces the lung capacity on that side by a quarter to a third, and that its effects persist for from six to nine months. Opinions differ

[6] Brit. Med. Jour., 1923, ii., 506.

[7] Tubercle, 1919, i., 1.
[8] Brit. Med. Jour., 1923, ii., 506.
[9] La Presse Médicale, 1923, i., 266.

as to its practical value by itself. It has been recommended in cases with adhesions of the base of the lung to the diaphragm, particularly those associated with cough. Mr. Morriston Davies has also found section of the left phrenic useful in left-sided cases associated with vomiting after cough. Phrenicotomy has also been employed in conjunction with other methods of treatment, notably pneumothorax, pneumolysis, and thoracoplasty. It seems worthy of more extended trial than it has yet received. The continuity of the nerve path may be severed by section, resection of a piece of its length, crushing, or by alcohol injection.

5. EXTRAPLEURAL PNEUMOLYSIS.

As long ago as 1892 Tuffier suggested that the diseased part of the lung might be allowed to collapse by stripping the pleura from the endothoracic fascia. This operation, to which the name of extrapleural pneumolysis has been applied, is easily effected by an incision through an intercostal space, and it has had a certain vogue since 1910. The real difficulty is the filling up of the extrapleural space left by the collapse of the lung. Attempts have been made to keep up an extrapleural pneumothorax by air injections. This often fails owing to the difficulty of retaining the air or to the accumulation of serous exudate which may become infected. More success has been obtained with fat grafts obtained from the subcutaneous tissue, omentum, breast, or from lipomata. Muscle has been used, small rubber balloons, and paraffin, but though some cases have been successful, there are many failures, either due to infection of the cavity left or to the formation of serous exudates leading to extrusion of the substance used for packing.

Separation of adhesions over the apical region only is referred to as apicolysis. Some surgeons, notably Bull of Christiania, perform apicolysis in the course of the operation of thoracoplasty after removing part of the third or fourth rib, and before dealing with the second and first ribs. On the whole, it seems that pneumolysis has given rather disappointing results, except in those where local pneumolysis has been aided by adequate fat grafts.

6. THORACOPLASTY.

There remains now for consideration the most effective of all the surgical methods of dealing with cases in which artificial pneumothorax fails or is impracticable owing to adhesions—viz., extrapleural thoracoplasty, which in its complete form consists in removal of segments of all the ribs from the eleventh or tenth to the first. It appears to have been first suggested in 1885 by Cérenville, and independently by Spengler. After 1907 the suggestion was taken up and developed by German surgeons, notably Brauer, Friedrich, Wilms, and Sauerbruch. The method was adopted and applied by Scandinavian surgeons soon afterwards. It received until recently little recognition in this country, except by Morriston Davies and Roquette, and it was looked on with disfavour in France, owing to its severity and mutilating character. In both countries it is now achieving tardy recognition. Two valuable papers on its technique and the indications for its employment have recently appeared in France by Profs. Bérard and Lenormant.[10]

Indications.—In general it may be stated that thoracoplasty is indicated in cases suitable for pneumothorax treatment in which that form of treatment is impracticable or has failed owing to pleural adhesions, but it should never be employed in such cases till the latter has been attempted. It must be remembered that even a complete thoracoplasty does not give more than three-quarters of the collapse of the lung afforded by a complete pneumothorax. Lenormant suggests that thoracoplasty is preferable to pneumothorax in cases with fistulous tuberculous lesions, either pleuro-pulmonary or pleuro-parietal, and also in cases with basal excavation, in which a partial thoracoplasty may suffice. It may also be considered in cases of severe recurrent hæmorrhage in which pneumothorax has failed.

The *contra-indications* are also practically those of artificial pneumothorax therapy, but the age limitations are more marked.

In coming to a decision as to its adoption in any given case a stricter standard as to the condition of the opposite lung and as to the general condition of the patient than that for artificial pneumothorax must be adopted and great attention paid to the condition revealed by X ray examination. Stereoscopic radiograms should be obtained if possible. A further point to bear in mind is that thoracoplasty throws the lung permanently out of action, unlike artificial pneumothorax, which can be stopped, allowing the lung to expand and re-function.

Methods.—(1) The original Brauer-Friedrich operation, a development of Schede's operation for empyema, consisted of a large curved incision from near the sternum below the clavicle down to the tenth rib and up to the level of the second dorsal spine behind. It allowed of extensive removal of all the ribs from the first to the tenth. It proved too severe for general use and was associated with a heavy early mortality. (2) The "pillar resection" or rib mobilisation of Wilms was introduced in 1911. It was a two-stage operation with an interval of three or four weeks. At the first, small pieces of the posterior part of the first seven or eight ribs were removed, while at the second, pieces of the anterior ends or of the rib cartilages of the first six were cut away. This, as a rule, gave insufficient collapse and both it and the Brauer-Friedrich operations are now discarded and are chiefly of historical interest. (3) The third form is that generally employed at the present time. It was introduced by Sauerbruch and adopted by Saugman, who did much to popularise it. A long hooked paravertebral incision is made, its lower end curving along the tenth rib to the posterior axillary line. The ribs are exposed by cutting through the muscles and drawing the scapula out of the way. Sections of the ribs from the tenth to the first are excised. Three centimetres or more of the first rib should be removed if possible. The amounts increase to the seventh or eighth and lessen to the tenth, but may increase progressively to this rib. A part of the eleventh may be taken, but it is better to leave it if possible as there is less likelihood of "diaphragmatic flutter." A point of great importance is that the place of section posteriorly should be as near the transverse process of the vertebra as possible. A total of 120 to 150 cm. of rib may be removed. The question as to whether the operation should be done in one or two stages, and as to the choice of anæsthetic, are matters of technique which vary with different operators. The general tendency is towards the two-stage form and the mortality of this is less. It is noteworthy that more and more surgeons are coming to employ general anæsthesia, usually gas and oxygen, combined with local anæsthesia to lessen shock.

Great care is necessary in the preparation of the patient for operation. He should be rested in bed and appropriate treatment directed to the circulatory and digestive systems, including the administration of sugar. Cough may be promoted shortly before the operation if there are cavities. Morphine or omnopon and atropine are usually given just before the anæsthetic. The after-treatment is even more important. Firm strapping and support during cough are essential to promote collapse and obviate "mediastinal flutter" or flapping movement of the mediastinum with respiration. Pain is often a distressing feature and may require analgesic drugs. Some surgeons claim that alcohol injection of the intercostal nerves during the operation obviates this. Dyspnœa is not infrequent but soon subsides. Digitalis, camphor, adrenalin, and oxygen may be used when necessary. A febrile reaction is common during the first few days after the operation. Bull's observations tend to confirm the general opinion that this is due to increased absorption of toxins owing to the disturbance and collapse of the lung. After healing some form of

[10] Journal de Chirurgie, xxii., 3, pp. 225 and 240.

corset support or bandage is worn, and if the patient is afebrile, exercises are devised to restore movements of the arm, which are usually at first limited. The patient should undergo a period of sanatorium treatment.

Risks of the Operation.—The immediate risks are those of shock, exhaustion, and wound infection, but the immediate mortality of the operation in experienced hands seems to be small, even as low as 2–4 per cent. The total mortality in the Scandinavian statistics is about 10 per cent., including the earlier cases. The later operative mortality is chiefly due to aspiration pneumonia, or to the spread of the disease in the opposite lung. The mortality is much greater in right-sided than in left-sided cases.

Results.—The recorded results are naturally somewhat varied. Of Saugman and Gravesen's 69 cases, 31, or 44·9 per cent., were fit for work at periods of from two to seven years after operation. In Bull's cases the number of cures after three years' observation amounts to one-third. Brauer's figures are very similar; recovery occurred in about 30 per cent., and in another 30 per cent. there was considerable improvement, while in 10 or 15 per cent. the disease progressed in the opposite lung. Thoracoplasty must therefore be admitted to have a useful place in treatment, but in view of its severity and of the fact that its effects are permanent, great care must be exercised in its application.

Modifications.—Various modifications of the original method are employed. A partial thoracoplasty is sometimes carried out for localised disease, either with or without pneumothorax, and it is sometimes recommended to cut the phrenic nerve shortly before the operation.

7. Other Surgical Measures.

The operation of lobectomy or excision of the diseased part of the lung is no longer employed in this disease. Ligature of a branch of the pulmonary artery has been carried out in hæmorrhagic cases and as a means of inducing fibrosis in a lower lobe. This operation is also now practically discarded. The treatment of the surgical complications of pulmonary tuberculosis such as fistula, tuberculosis of the epididymis, kidney, glands, and spine, are all matters in which we have to invoke the aid of the surgeon. The question as to the advisability of operation in such cases largely depends upon the stage of the pulmonary disease. Only operations of urgency or of necessity should be undertaken in patients with quiescent tuberculous disease, since general anæsthesia seems not infrequently to activate dormant lesions. Wherever possible operations should be done under local or spinal anæsthesia. At the same time, the experience of thoracoplasty proves that patients with active disease can take general anæsthetics such as gas and oxygen without undue risk.

8. Rôle of Surgery in the Treatment of Pulmonary Tuberculosis.

The boundary zone where medicine and surgery meet is a fascinating territory to explore, but one with pitfalls. In the surgery of the stomach, duodenum, gall-bladder, appendix, and bowel, the most dramatic results are obtained in cases in which medicine has failed most lamentably. The surgery of pulmonary tuberculosis promises to give like results, but it should be clearly recognised that surgery in this disease is not, and cannot be, a substitute for medical measures, but that it may be a valuable adjunct. This branch of surgery, perhaps more than any other, demands an understanding between the physician and the surgeon and a knowledge on the part of the surgeon of the medical problems involved to a greater extent than any other. The operation carried out must be devised to meet the needs of the individual patient. Surgery cannot here be the first line of attack, but it can be a very helpful aid. We may hope that a truer perspective will obtain here than was the case in the early days of gastric surgery.

Conclusion.

It is now my duty to express my thanks to my friends and colleagues who have helped me in preparing these lectures, particularly to Dr. R. C. Wingfield, who has helped me in many ways and lent me the radiograms and photographs I have shown; to Mr. A. Tudor Edwards for his criticism and advice in regard to the operative procedures; and to Dr. D. E. Bedford for assistance in looking out references. Lastly, I have to express to yourself and the Council of this Society my appreciation of the honour you have done me in asking me to deliver these lectures, an honour as gratifying as it was unexpected. Although I feel that I owe this distinction to my association with the two hospitals in which I worked as a student and which it is now my privilege to serve, my pleasure is none the less great. Though I have not been able to present anything new or dramatic, I like to think that my choice of subject at least would have been agreeable to the distinguished physician and philanthropist whose memory we commemorate in these annual lectures. In his "Hints for the Establishment of a Medical Society in London" he wrote: "The principal part of our knowledge must be ever derived from comparing our own observations with those of others." This I have tried to do in regard to this disease, and in preparing this review of the methods of treatment now in use, I at least have been greatly the gainer.

From the Royal School of Medicine, Cairo.

THE INCIDENCE OF CANCER IN EGYPT.

An Analysis of 671 Cases.

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An inquiry into the incidence of cancer and malignant disease in general, in Egypt, will help to throw some light upon the history, ætiology, and probable causation of this disease. Not only are we dealing with a population of an entirely different race from any in Europe, but we have also a considerable admixture of the Negroid and Negro-Arab to consider. The diet of the population, and, above all, the prevalence of parasitic disease in the country, are of value in the consideration of the relation of malignant conditions to diet and to parasitic disease. Ninety per cent. of the fellaheen or country people of Egypt probably suffer at one time or another from bilharzia, ankylostoma, and ascaris, or a combination of all three. There is now statistical evidence that the picked men of the fellaheen population who enter the army or the police are infected with these three diseases to the extent of 85 per cent. The more cosmopolitan urban population of Egypt, which numbers about 20 per cent. of the whole, is much less uniformly affected.

The habits and customs of the people are also utterly different from those of England or America, but in spite of these differences and, particularly, of the amount of parasitic disease, the total number of cases of malignant disease in proportion to population is probably very much less than in England. There are no complete statistics; but the comparison of the number of cases attending the main hospital of Egypt with those attending a general hospital of the same size in London gives us this impression. But if the total amount is less, the incidence and anatomical distribution of cancer is entirely different in Egypt from that of more temperate regions. In the first place, the incidence among the various races and racial elements in Egypt appears to be strictly in accordance with the racial proportion in

the population. The Negro from the Sudan with woolly hair and coal-black skin, and the Berberine, a Negro-Arab, with less pigment in his skin and less kink in his hair, are as often affected as the brown-skinned flat-black-haired Egyptian, or even the fair Turk and Armenian. Our experience of cancer in negroid peoples seems, therefore, to be different from that of other observers.

Incidence of Disease from Hospital Figures.

We have analysed all the cases of cancer and malignant disease (671) that have attended this (Kasr-el-Ainy) hospital in the last four years. This hospital has 400 available surgical beds, a yearly in-patient population of 13,000, and a yearly out-patient attendance of 122,000, drawing patients from the whole of Egypt. Thus it reflects the comparative incidence of disease in the whole country.

Epithelioma of the scalp is definitely more common than in England or America (30 cases). An explanation for this may be found in the habit of shaving the head, the great incidence of favus and other irritating skin conditions, and the intensity of the actinic rays of the sun. Sarcoma of the flat bones of the skull is also definitely more common (10 cases); this is in accord with the great prevalence of sarcomata of the long bones (49 cases), and of the bones of the face, especially of the upper and lower jaws (23 and 16 cases respectively). Myelomas of the long bones, the jaws and clavicles, are in proportion to the prevalence of periosteal and endosteal sarcomata. The malignancy of sarcoma of the long bones is not so great, however; gland involvement and metastatic growths are late and comparatively rare. There are a large number of cases in which a general cachexia or sepsis has killed before secondary deposits have occurred. This is, in our opinion, a very marked feature of Egyptian sarcoma and of cancer. Melanotic sarcoma is rare, possibly owing to the general distribution of pigment and to the absence of scattered areas of pigment, as moles and freckles, among our people.

Rodent ulcer (41 cases) is a very common condition in Egypt. It presents no unusual features, and may be attributable to the exposure of the fellaheen to sun in their field work. The region of the orbit is most commonly affected. Malignant epulis is probably not more common than elsewhere; but there is a very common condition of epithelioma of the lower jaw that is entirely different in its onset and its development from any in our experience elsewhere. This disease commences in the alveolar margin of a tooth that is intrinsically healthy, but has a marked deposit of tartar and food débris at the junction of tooth and alveolar margin. In this respect it is essential to say that, except among the more leisured classes, there is no system of brushing teeth in Egypt, not even with a twig or piece of wood as is the case in the Far East. Egyptian adult teeth of the labouring classes, though, as a rule, free from caries, are yet filthy in that there are gross collections of tartar and food débris at the neck of the teeth, and in very many cases the gums are swollen, septic, and inflamed. True cases of pyorrhœa are not uncommon. It is also interesting to observe the prevalence of true dental caries and alveolar abscesses in the jaws of Predynastic, Dynastic, and Ptolemaic Egypt. Through all the ages from 2000 years B.C. the dental treatment of ancient Egypt was deplorable. Whenever the pulp cavity of an ancient Egyptian tooth had been exposed an abscess had formed, and no attempt apparently been made to extract even the most decayed teeth. They are left in situ with all the evidences of years of abscess formation and new inflammatory bone.

The epitheliomatous conditions of the jaws in modern Egypt, as referred to above, are remarkable for the rapidity of their development, the uniform commencement in the alveolus of a tooth, the rapid separation of a sequestrum of the whole thickness of the alveolus carrying from two to six teeth; and, finally, the often complete absence of glandular involvement even in the submaxillary region. Were it not for the histological appearances one would look upon this condition as a septic osteomyelitis of the jaw. Death occurs from aspiration pneumonia, and not, as one would expect, from hæmorrhage from the vessels of the floor of the mouth.

Cancer of the Lip, Tongue, and Œsophagus.

Cancer of the lip is not common (31 cases). There appears to be no relation between this form of cancer and smoking. Tobacco is smoked, as a rule, by the country people by bubbling the smoke through water in a "hookah," the mouthpiece of which is of smooth and polished amber, or by rolled cigarettes. The young urban population, however, and the leisured classes of Egypt now affect the cigarette, but they exhibit a much less marked tendency to lip cancer than the fellaheen who work in the sun all day.

Cancer of the tongue is not common (25 cases), and is characterised by special features. It has a slow development; it is not associated with evidences of syphilis; glandular involvement is very late indeed even in the submaxillary region, and death from secondary hæmorrhage from the lingual or carotid vessels comparatively unknown. We have never seen cancer of the tongue develop in any but a very septic mouth; nor have we been able to discover in Egypt any cases of the typical chronic superficial glossitis of that organ or any evidences of gross tertiary syphilis in connexion with tongue cancer. Tooth plates and artificial dentures are not indulged in by the fellaheen. Death in cancer of the tongue is usually a result of aspiration broncho-pneumonia.

Cancer of the œsophagus is very rare (six cases). The operation of gastrostomy for pharyngeal and œsophageal cancer has only been performed three times in five years. Malignant disease, intrinsic or extrinsic, of the larynx is much more common (29 cases). Tonsillar cancer is almost unknown. No case of chloroma in children has been observed during the last five years.

Cancer of Breast and Cervix.

Cancer of the breast (75 cases) presents no unusual features in its incidence, type, or development from that observed elsewhere. It is sometimes difficult to determine the age-factor, as many of the fellaheen do not know their true ages. Breast-feeding among babies is common up to two or three years. To wean a child before that time is almost tantamount to a death sentence. Feeding-bottles are, in Egypt, fatal to babies; but fortunately they are rarely used among the country people. Wet-nurses are the rule. Many mothers develop acute mastitis and mammary abscesses. We gather the impression that cancer of the breast is more commonly of the rapidly growing encephaloid variety, and that fungation is perhaps more common in Egypt than in England or America. But this may be owing to the fact that cases of breast cancer seldom come to hospital in any but an inoperable condition. Two cases only of fibro-adenoma or simple tumour of the breast have occurred in this period of three years, although careful search for this condition has been made in all our women patients. Nor have any cases of chronic interstitial mastitis, with or without cystic degeneration, been observed. This appears to negative any causal relation between the degenerative changes in the involuting breast of the woman of 40 and the development of cancer.

Cancer of the cervix (19 cases) and of the body (six cases) of the uterus does not appear to differ in appearance or type from that observed elsewhere. It is, however, a very much rarer condition in Egypt than in England or America. These cases arrive usually in an inoperable state. As the vast majority of our women are married and have borne children we can draw no conclusions in regard to the influence of pregnancy upon malignant conditions of the breast or uterus.

Cancer of Digestive Tract.

It is in the digestive tract that the incidence of cancer is most remarkable. There is practically no cancer of the stomach in Egypt, only eight cases in three years; and, as there is also very little gastric ulcer, six cases in the same period, there appears to be a definite causal relationship in a negative way between the two conditions. Secondary cancer of the liver, as one would expect, is rare (four cases); but primary cancer originating in the gall-bladder and the gall-bladder fissure of the liver is much more common (ten cases). As the incidence of gall-stones in Egypt, six cases in this period of three years, is negligible, in spite of the fact that typhoid fever is endemic, there does not appear to be any connexion between gall-stones and the development of carcinoma of the gall-bladder.

In the large intestine, again, cancer is very rare in spite of the universal parasitic infection of the colon, and, especially, the prevalence of bilharzial growths and papillomata. These do not appear to present any tendency to malignant development. Cancer of the rectum (seven cases) is comparatively rare, notwithstanding that it is the most common site for bilharzial papillomata and growths with the consequent irritation of the lateral-spined ova of this parasite.

In the urinary bladder, however, the incidence of malignant disease, both carcinoma and sarcoma, as a sequel to the irritation of the terminal-spined bilharzia ova in the foul and alkaline bladders of cystitis is extremely common (51 cases). But we know of no cases of epithelioma of the kidney pelvis or of the ureters, in spite of the common infection of the whole urinary tract with bilharziasis. We believe that the alkalinity and sepsis of an inflamed bilharzial bladder is partly responsible for the development of carcinoma in that organ. We have seen no cases of the development of cancer in a non-inflamed bilharzial bladder. The large intestine is even more exposed than the bladder to the irritation of parasites, but the reaction of the contents of the bowel is usually acid, and chronic sepsis, such as is found in cystitis, is not present.

Malignant conditions of the kidney, including hypernephroma, are also extremely rare. The prostate, however, is a very common seat of cancer, but simple enlargement of that organ is much less frequent than in England or America. There are very seldom indeed any cases of chronic prostatitis or gleet among the fellaheen. Early marriage seems to be responsible for the non-development of both these conditions, though, we must admit, the severity and complications of gonorrhœa among Egyptians are much less marked than in Europeans resident in Egypt. Gonorrhœal and syphilitic infections contracted from the same source, for example, a Levantine woman, are infinitely more severe in a Northern European than in an Egyptian. There can be no acquired immunity to syphilis of very long standing, for there are no evidences of syphilis in the bones of Predynastic, Dynastic, or Ptolemaic Egypt. It is probable that cancer of the prostate is usually an extension of the disease commencing in the trigones of the bladder from pre-existing bilharziasis.

Cerebral Tumour.

Cerebral tumour is comparatively very rare in Egypt (11 cases). Ancient Egyptian skulls show definite evidences of malignant conditions; but in the majority of cases these appear to be extensions from epitheliomata of the scalp or from rodent ulcer of the face. Malignant disease of the thyroid gland is not uncommon (15 cases). As a primary growth it is not associated with disorder of function of that gland; but in two cases where there were secondary deposits of breast cancer in the thyroid gland there were marked evidences of hyperthyroidism. In this connexion it is interesting to observe that although there are a large number of cases of simple parenchymatous goitre, adenomata and cysts (122 cases), in Egypt we practically never see a case of exophthalmic goitre or of cretinism among the country people (one case of each in three years).

Diet of the Egyptians.

The diet of the fellaheen who comprise 80 per cent. of the population of the country is almost entirely vegetarian. Meat is usually eaten once a week only; and goat or mutton is the meat of choice. Swine flesh, as in all Moslem countries, is forbidden. So is alcohol in any of its forms. Cheese, milk, eggs, and beans form a large proportion of the daily diet. The green tops and roots of vegetables, such as radishes, are constituents of nearly every meal. Potatoes are not grown in Egypt, and are only eaten in the towns. Expectant mothers and lying-in women eat chicken for two weeks. As a rule the pigeons and chickens are sent into the towns to be sold.

Pigeons are kept chiefly for the value of their guano in growing melons. Tomatoes form a large ingredient of the common food. Onions, as would be expected, are a constant feature of every day diet. Fruits, with the exception of dates, fresh figs, apricots, and, especially, water melons are not commonly eaten except in the summer months. There is no method of preservation of food by smoking, salting, or drying in the sun, or by any chemical means. Nor is frozen or chilled meat ever eaten by the vast majority of the people. On the occasions of ceremonial feasts a large amount of animal food is eaten. This chiefly consists of mutton or goat, chickens and turkeys; but the average diet of 70 per cent. of the people for six days of the week is eggs and cheese and herbs, onions, beans, tomatoes, unleavened bread, and the green tops of vegetables, especially of the radish family.

But it is interesting to observe that, in the towns where the Egyptian people, often of the more leisured classes, have adopted European habits of food and cooking they have acquired European diseases. Egyptians of the richer classes of society, whose inclination or work keeps them in the cosmopolitan towns, do develop gastric and duodenal ulcer, gall-stones, and appendicitis, and with the development of these surgical aspects of gastro-enteritis also comes a predisposition to gastric and intestinal cancer, conditions which are almost unknown to their simpler compatriots in the country districts.

Conclusions.

It may be objected that the experience of one hospital is no true criterion of the incidence of malignant disease in a whole country. But we can rightly claim that Kasr-el-Ainy is the great medical and surgical court of appeal for the whole of Egypt. We draw from the whole of the Nile valley; and we are peculiarly situated so as to obtain as clear a view upon the prevalence of malignant disease as the absence of full statistical evidence will allow.

The conclusions to which we have come as a result of our daily work and the examination of these cases are these:—

1. The incidence of cancer among Negroes is not essentially different from that of Negroid, Negro-Arab, or the Egyptian races.

2. There is no causal relationship between cancer and parasitic diseases. It appears to be merely the irritation of the parasites and their ova and embryos and the coincident chronic sepsis which is responsible. But the incidence of cancer in relation to bilharzia of the bladder suggests that, only in an alkaline-infected medium such as the stagnant urine of cystitis in bilharzial bladders, does the irritation of ova produce cancerous changes. In the renal pelvis, the ureter, and the intestinal canal the incidence of parasitic disease is almost as great as in the bladder, and yet the development of cancer is almost unknown.

3. There seems to be no connexion between cancer of the tongue and syphilis.

4. Malignant disease affecting the bones, the skin, and skin appendages appears to be definitely more common than in Europe or America, and may be attributed, as far as the skin is concerned, to the actinic rays of the sun of Egypt.

5. There is a definite relationship, from a negative point of view apparently, between the incidence of gastric ulcer and gastric cancer.

6. There is no relation, presumably, between gall-stones and cancer of the gall-bladder or the gall-bladder fissure of the liver. Nor is typhoid fever, in Egypt, a predisposing factor in the production of gall-stones.

7. The comparative incidence of cancer of the uterus and breast in married and unmarried women does not allow of any statistical conclusions to be drawn, in Egypt, where the vast majority of all women have been married very early, usually some time before 20 years, and have borne children. The comparative absence of non-malignant conditions of the breast, such as fibro-adenoma, and, especially, chronic interstitial mastitis of the involuting breast, with or without cystic degeneration, is remarkable and inexplicable. The latter state is looked upon by some pathologists as a precancerous condition; but our experience in Egypt seems entirely to negative any relation whatever between chronic interstitial mastitis, which is practically unknown, and cancer of the breast, the incidence of which is probably the same in proportion as in Europe.

8. The progress and development of individual cases of cancer is definitely different in Egypt from that of England or America. The progress is, as a rule, less rapid, the involvement of glands less marked, and the development of metastases more infrequent. There appears also to be a form of epithelioma of the alveolar margin of the jaw that exhibits most unusual features (vide supra).

9. There appears to be some definite relation between cancer and diet. Simple vegetable foods, the absence of preserved, chilled, or frozen meat of any kind, the lack of jams or fruit preserved in sugar, and the complete avoidance of alcohol in any of its forms seem to be consistent with the non-development of cancer of the intestinal tract. While the adoption of European foods, alcohol, and preservatives by the same people in the cosmopolitan atmosphere of towns definitely appears to be responsible for gastric and duodenal ulcer, gall-stones, appendicitis, and cancer of the digestive tract.

10. The almost complete absence of functional nervous disease among the simple fellaheen, and, indeed, of organic disease of the nervous system also, has, we consider, a most important bearing on the development of cancer in Egypt. For diet alone will not serve to explain the incidence of cancer. Nor can the use or abuse of alcohol or tobacco be called upon to account for the discrepancy between Egyptian and European cancer. The whole of pagan Africa seems to have learned how to ferment corn as soon as it learnt how to grow it, though the use of alcohol, in the form of native beer or spirit, was usually reserved for ceremonial occasions. But the incidence of cancer appears to be the same in the pagan African from the Southern Sudan as in the non-alcoholic Moslem Arab or Egyptian.

One great and compelling cause for the distribution and incidence of cancer lies, we believe, in the relative freedom of the fellaheen of Egypt from nervous diseases, functional or organic. This also serves to explain the absence of exophthalmic goitre or cretinism in a country where simple goitre is so common. It also explains many of the other contradictions in the surgery of Egypt. The industrial revolution of the nineteenth century has passed Egypt by. Rural Egypt has hardly changed in 3000 years. The internal-combustion engine, the bicycle, the sewing machine, electricity, the telephone, the daily paper, the printing press, or wireless telegraphy have not happened as far as the majority of the fellaheen are concerned, for 75 per cent. of them cannot read or write. None of these advances in civilisation have altered their lives to any great degree. The only obvious change in the life of the fellaheen in 3000 years, probably, lies in the substitution of paraffin as an illuminant for the primitive bean oil. There is an absence of financial stress and strain, though there is great poverty. The Egyptian fellah, and he forms 80 per cent. of the population, puts his savings into such objective and solid investments as land and cattle. For him there are few uncertainties in regard to seasons. The Nile flood has taken all worry and anxiety from him in that respect. His buffalo is immune to cattle plague as it is, relatively, to tubercle. To each fellah is his reward according to his toil. Money to him does not represent a source of credit or even a medium of exchange; it is an object in itself to hoard or to bury, but never to lend at usury. Stocks and shares and cotton futures mean nothing to him. So the wear and tear and nervous strain of modern twentieth-century life do not affect him. There is very much more, in all probability, than an accidental relationship between the almost complete absence of functional nervous disease and hysteria among the fellaheen and the rarity of abdominal cancer, of symptomatic enteroptosis, of mucous colitis, and the whole train of subjective nervous phenomena which Arbuthnot Lane embraces under the heading of intestinal stasis.

The psychology of Egypt is totally different from that of England or America as a whole. There are no suppressed emotions or complexes in the Near East or the Mediterranean littoral; no need for psycho-analysis. In the presence of death, grief is overwhelming. Mourners tear their clothes and hair, wring their hands, and express their sense of loss in torrents of tears. Fear expresses itself in terms of panic-stricken flight, religion in wide-eyed frenzy and fanaticism on occasion. There is no reserve, no disciplined dry-eyed suffering, though there is a fine dignity in the Orient; no stoicism, though there is an admirable endurance of pain. We have no gastric invalids in Egypt, no nervous dyspepsias, no hypochondriacs, no valetudinarians, except among the student and leisured classes; and that is perhaps why we have, comparatively, no gastric ulcer, no gall-stones, no appendicitis, and no gastric cancer.

AN UNEXPLAINED DIAZO-COLOUR-REACTION IN URÆMIC SERA.

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THERE have been numerous recent studies in the literature, especially in Germany, on Hymans van den Bergh's application of Ehrlich's diazo-reaction to the study of bilirubin in the blood-serum. The technique of this test has been described in this country by McNee.[3 4] Briefly, it consists of the addition of a freshly made mixture of diazotised sulphanilic acid and sodium nitrite to the serum; a pink colour due to azo-bilirubin may appear either at once (direct reaction); or only in alcoholic solution, after removal of the protein (indirect reaction).

I have lately studied this test in 184 patients, mostly suffering from jaundice or some condition affecting the liver. The series included, however, "controls" suffering from other diseases; and it is with 16 patients suffering from nephritis that this note deals. It was found in performing the indirect test (in alcoholic solution) on the serum of certain of these patients that an orange-buff colour appeared. This gradually deepened over a period of 24 hours. At the end of this time it seemed possible that the

colour was due to azo-bilirubin "gone wrong"; so the solution was made alkaline, in order to test for the green colour which azo-bilirubin has in alkaline solution. Quite unexpectedly a beautiful cherry-pink colour appeared, and after lasting for a few minutes faded away. Similar results were obtained in at least eight patients with uræmia, and in no other patient. It was specifically looked for in at least 22 other patients suffering from various diseases. I can find no reference to this colour-reaction in the literature.

The characters of the reaction are as follows: The colour differs from that given by bilirubin (1) in being buff instead of pink; (2) in coming very slowly, even in the presence of alcohol; (3) in turning pink instead of green on being made alkaline. The reaction does not take place satisfactorily in aqueous solution. The buff colour begins to appear in a few minutes and its rate of development is proportional to the depth of colour ultimately reached. The pink colour is brought out on adding alkali after 24 hours, or earlier if the buff colour is very deep. Caustic soda must be the alkali used; ammonia and sodium carbonate do not cause a good pink to appear. The pink colour persists for from a few seconds to over half an hour; the deeper it is the longer it lasts. Some nephritic sera give a faint buff colour but no pink on adding alkali, perhaps because the substance is too dilute.

Clinical Aspect of the Reaction.

The table of the clinical results shows that it occurred only in patients with severe uræmia; all those giving it had at least 220 mg. of urea per 100 c.cm. in their blood. Their uræmia was due to varying causes—hydronephrosis, polycystic disease, contracted red kidneys, contracted white kidneys. A positive result was not necessarily associated with twitching or convulsions; in other words, it occurred in any of the clinical types of uræmia.

Table showing Clinical Results.

Case.	Sex.	Age.	Date.	Bilirubinæmia.	Buff.	Pink with alkali.	Twitching or fits.	Blood-urea mg. per 100 c.cm.	Basis of diagnosis.
1	F.	50	12.9.23	N.*	—*	—*	0	280	P.M.
2	M.	60	25.6.23	Sn.	+	+	+	400	P.M.
3	M.	14	24.6.22	..	—*	—*	0	160	Clin.
4	M.	53	20.7.22	O.n.	—*	—*	0	103	P.M.
5	M.	33	25.4.23	N.	+	+	0	500	P.M.
6	M.	46	25.4.23	..	+	0	+	—	P.M.
6	M.	46	28.4.23	..	+	+	0	—	
6	M.	46	11.5.23	Sn.	+	0	0	470	
6	M.	46	24.5.23	..	+	+	0	—	
6	M.	46	2.6.23	..	+	+	+	—	
6	M.	46	6.6.23	..	+	+	—	—	
6	M.	46	9.6.23	..	—	+	—	600	
7	?	?	28.4.23	N.	0	0	? 0	40	Clin.
8	M.	21	30.4.23	Sn.	+	—	?	250	P.M.
9	M.	15	10.5.23	..	0	0	0	60	Clin.
10	M.	?	10.5.23	N.	? +	0	0	—	P.M.
11	F.	27	14.5.23	Sn.	0	0	0	275	
11	F.	27	15.5.23	..	0	0	0	—	
11	F.	27	19.5.23	..	? 0	0	0	? > 275	P.M.
11	F.	27	20.5.23	..	+	0	0	—	
12	M.	?	25.5.23	N.	? +	0	0	170	Clin.
13	M.	11	20.6.23	Sn.	—	—	0	650	Clin.
14	F.	60	25.6.23	..	—	—	0	300	P.M.
15	F.	38	4.9.23	..	—	+	0	—	P.M.
16	M.	53	29.7.23	..	+	+	+	220	Clin.

N., normal. N.* normal (½ unit). Sn., subnormal. O.n., over normal (2 units). —*, not looked for.

Comment.

Case 1.—Heart failure + nephritis.
Case 2.—Gout. Hepatic cirrhosis.
Case 4.—? Yellow conjunctivæ on admission.
Case 6.—Polycystic kidneys.
Case 8.—Rose Bradford kidneys.
Case 9.—More chloride than nitrogen retention.
Case 10.—Pyelonephritis.
Case 11.—Acute arthritis and pericarditis (rheumatic ?) with interstitial nephritis. No symptoms of uræmia.
Case 12.—Enlarged prostate.
Case 14.—Double hydronephrosis.
Case 15.—Small red kidneys.

It will be seen that patients dying of definite uræmia always showed this reaction. Case 11 did not show it and clinically appeared to be dying more of her acute infection than of failure of renal function. In some patients, such as Case 6 on two occasions, and Case 11 on one occasion, the yellow buff colour appeared, but no pink on alkalinising. The diazo-reagent, if left overnight, goes yellow by itself (but not pink on being made alkaline later). While I do not think this has any bearing on the colours obtained, I have refrained from laying any stress on a colour which did not go pink on subsequently adding alkali. Normal sera give a yellowish colour with the diazo-reagent in alkaline solution; the buff colour of the reaction described above develops in acid or neutral solution.

Results of Other Workers.

Van den Bergh [5] found that a hypobilirubinæmia was the rule in nephritis. I was able to confirm this; in the table above, the title "subnormal" means that there was too little bilirubin in the serum for accurate measurement. Feigl and Querner [2] found that there was usually very little bilirubin in the serum unless there was heart failure as well. Beth [1] considers that bilirubinæmia is an important diagnostic point between malignant nephrosclerosis and chronic nephritis. In the first case he finds a bilirubin value above normal; in the second case, little or none.

Problem of Causation of the Reaction.

To what is the buff-and-pink colour-reaction due? Normal urine does not give the reaction, so that unless the reaction is inhibited by something else in the urine it is not due to a normal urinary constituent. It is not due to urea, since its intensity does not go hand in hand with the blood-urea; moreover, urea gives no colour with the diazo-reagent in acid or alkaline solution, in watery solution, or when mixed with serum. Nor is the reaction given by uric acid or creatinin. It is not due to any substance of the nature of a protein. It still occurs after boiling for a minute, after precipitating the protein with alcohol, or after boiling the alcoholic solution and filtering. After distilling off the alcohol from an alcoholic solution, the biuret test was negative. This diazo-reaction does not behave in the same way as that given by urochromogen or antoxyproteic acid. I was unable to exclude an amino-acid as the cause of the reaction. It must be mentioned that on two occasions where the serum gave a positive reaction, none was obtained in the cerebro-spinal fluid. In one case, however, giving a very deep colour in the serum, a faint buff (and pink on alkalinising) was obtained with the cerebro-spinal fluid, which was practically uncontaminated with blood.

I also examined the sera of three rabbits kindly given me by Dr. C. C. Twort. One of these had a growth in its pharynx, had taken no fluid for a day or two before its death, and died with a blood-urea of 300 mg. per 100 c.cm. Two others were suffering from nephritis and died with blood-ureas of 300 and over 100 respectively. All three of these sera gave a yellowish-buff colour (not given by normal rabbit sera), but no pink on adding alkali.

Summary.

The serum of patients with a severe grade of uræmia contains a substance which gives a characteristic colour-reaction with Ehrlich's diazo-reagent. The nature of the substance is at present undetermined. The observations of other workers that the serum-bilirubin is below normal in nephritis are confirmed.

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EXCISION OF THE RECTUM.

ABDOMINO-VAGINAL AS AN ALTERNATIVE TO ABDOMINO-PERINEAL EXCISION.

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I COMMEND the operation I am going to describe to the consideration of those who practise abdomino-perineal excision of the rectum as an alternative to the latter operation under certain circumstances.

In the early part of last year a female patient was sent to me on account of a mass behind the uterus. When the abdomen was opened the mass proved to be a carcinoma of the rectum, about an inch above the bottom of Douglas's pouch. I closed the middle-line wound, performed colostomy as high up the pelvic colon as was feasible, and proceeded to consider the best way of dealing with such growth in a feeble woman between 60 and 70 years of age. I decided that she would probably not stand a classical abdomino-perineal resection, and I therefore performed the following operation.

I first packed the vagina with gauze soaked in violet-green as though for a Wertheim's operation, and then, reopening the middle-line incision, crushed and divided the bowel below the colostomy and separated it down to the upper surface of the levators, following thus far the technique of my friend and generous teacher, Mr. Ernest Miles. The uterus being pulled upwards and forwards, I then, with a scapel, divided the whole length of the posterior vaginal wall by cutting on to the gauze packing. The gauze packing was then pulled out via the vagina by an assistant. I had previously tied a strong piece of sterilised string around the upper end of the detached segment of bowel and this was passed on a forceps through the incision into the vagina where it was seized by the assistant, who, pulling upon it, pulled the whole length of freed bowel out through the vulva.

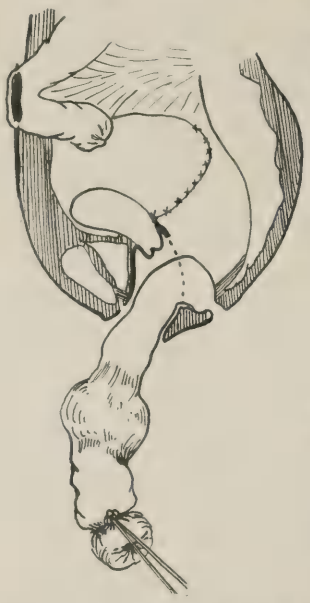

Diagram showing the bowel pulled through the incision in the posterior vaginal wall. The line of this incision is dotted. The position of the peritoneal roof is marked by crosses. The position of the growth in the bowel is indicated, as is the colostomy.

I then made a peritoneal floor exactly as though I was performing abdomino-perineal excision, except that it was far more easily and neatly done, as there was no mass of bowel to sew over, but, instead, a deep empty hole between the back of the vagina and the face of the sacrum. The abdominal wound was then closed (see diagram).

The patient was now placed in the lithotomy position with the freed bowel hanging out of the vagina, and I found there was length enough of bowel below the growth to enable me to crush and divide the bowel about two inches from the anus. I proceeded to do this and then inverted the ligatured end by a purse-string. Finally, the hole in the posterior vaginal wall was closed by a continuous catgut suture, a small gap being left at its lower end, through which a tube was passed into the empty space behind the vagina. The operation was relatively easy and rapid, and except for a little bleeding from the vaginal wall there was no hæmorrhage to speak of and no shock, and she recovered well.

I am not aware of this method having been described before, and my object in recording it is to suggest it as an alternative to the classical operation. The superior ease with which the gap left by the removal of the bowel from the hollow of the sacrum can be roofed over by peritoneum is very marked, especially by contrast with these cases of abdomino-perineal excision, where the detached bowel is hypertrophied and full of flatus. The avoidance of the perineal incision and the cutting of the levators, which is the stage where most of the shock and bleeding is incurred in the abdomino-perineal operation, is also a great gain, and where the growth is above the level of Douglas's pouch (and it is for such cases that the operation is specially suitable) the non-removal of the last inch or two of the bowel will not materially affect the patient's chances of cure.

If it be desired to remove this last two inches, the middle-line incision in the posterior vaginal wall could be carried down to the vaginal orifice and continued round the anus from that point, thus minimising the extent of the perineal wound and avoiding the excision of the coccyx.

ANIMAL TUMOUR CELLS MADE RESISTANT TO X RAYS BY X RAYS.

BY S. RUSS, D.Sc., F.INST.P.

(*From the Cancer Research Laboratories, Middlesex Hospital.*)

PREVIOUS experiments [1] have shown that when animal tumour cells are given a dose of rays from radium just less than lethal they may remain in the body for some months without showing any sign of growth, but eventually they begin to grow steadily, although, as a rule, at a slower rate than the normal. The experiments described below show that if tumour cells are irradiated with almost a lethal dose, their descendants will not be so sensitive to the same dose if it is repeated some time afterwards, and eventually the tumour cells may become extraordinarily resistant to the rays.

Experimental Work.

In the X ray treatment of cancer this fact is obviously of importance, and I am recording briefly a series of experiments which has so far lasted about a year. Previous experiments have shown that, in order to give a lethal dose of X rays under certain specified conditions of distance and output of radiation, the exposure takes about 56 minutes for the tumour used in these experiments—viz., Jensen's rat sarcoma. The chronological sequence of the experiment is given below. All the experiments in which radium was used were carried out in vivo, the X ray experiments were all done in vitro.

Expt. 1.—An inoculation of a normal rat sarcoma grew to size $4{\cdot}5 \times 4{\cdot}9$ cm. in seven weeks. A platinum tube containing 50 mg. of radium bromide was inserted into the middle of the tumour, fixed by sutures and left in position for 24 hours. Portions of tumour 2 cm. from the mid-point of tube were then removed and inoculated into ten rats. Eight tumours grew at very nearly the normal rate of growth.

Expt. 2.—One of these tumours (Expt. 1) grew to size $2{\cdot}2 \times 2$ cm. in three weeks, and a 10 mg. tube of radium bromide was inserted into the tumour and left for three days. Portions of tumour 0·7 cm. from the mid-point of the tube were removed and inoculated into seven rats. One tumour grew at about one-twentieth of the normal rate of growth.

Expt. 3.—The tumour last mentioned grew to size $1 \times 0{\cdot}8$ cm. in two months; it was transplanted into six normal rats. Five tumours grew at about one-third of the normal rate of growth.

[1] Dr. Helen Chambers and S. Russ: Proc. Roy. Soc., 1913, B, vol. lxxxvi.

Expt. 4.—One of these slowly growing tumours (Expt. 3), which grew to size 2·3 × 1·7 cm. in ten weeks, was excised and thin slices exposed to X rays for 45′ and 60′. The piece irradiated for 45′ was inoculated into 20 rats and 17 (i.e., 85 per cent.) tumours grew at about one-seventh of the normal rate. The piece irradiated for 60′ was inoculated into 24 rats and 15 tumours (i.e., 62 per cent.) grew at about one-twelfth of the normal rate.

Expt. 5.—One of the tumours in the 60′ batch (Expt. 4), which grew to size 1·2 × 1·1 cm. in five weeks, was excised and thin slices exposed to X rays for 90′ and 135′. The piece irradiated for 90′ was inoculated into 20 rats and ten tumours (i.e., 50 per cent.) grew at about one-sixteenth of the normal rate. The piece irradiated for 135′ was inoculated into 17 rats, no tumours formed, but in five animals small nodules persisted for about three weeks.

Expt. 6.—One of the tumours in the 90′ batch (Expt. 5), which grew to size 1·5 × 1·4 cm. in four weeks, was excised and thin slices exposed to X rays for 90′, 135′, and 180′. The piece irradiated for 90′ was inoculated into 19 rats and eight tumours (i.e., 42 per cent.) grew at about one-twentieth of the normal rate. The piece irradiated for 135′ was inoculated into 18 rats and two tumours (i.e., 11 per cent.) grew very slowly. The piece irradiated for 180′ was inoculated into 14 rats and three very small tumours grew which measured about 5 × 5 mm. at the end of one month.

Expt. 7.—One of the tumours in the 135′ batch (Expt. 6), which grew to size 1·3 × 1·1 cm. in five weeks, was excised and thin slices exposed to X rays for 140′ and 200′. The piece irradiated for 140′ was inoculated into 15 rats and two small nodules have persisted for six weeks. The piece irradiated for 200′ was inoculated into 15 rats and two small nodules have persisted for six weeks.

It will be seen that at Expt. 5 in the experimental series the tumour cells had developed an increased resistance to X rays, so that an exposure of 90 minutes was not enough to prevent a considerable proportion of tumours growing. In Expt. 6 tumour cells had grown when transplanted into rats, though they had had an exposure lasting 135 minutes. In other words, the lethal dose has been increased about two and a half times.

Ten years ago Nogier and Regaud [1] drew attention to the clinical fact that malignant growths, when exposed to X rays, suffered a gradual diminution in their sensitiveness to the rays. They advanced the argument that the various fluids of the body played some protective part in this process. Marie, Clunet, and Raulot-Lapointe [2] exposed a sarcoma of the mouse repeatedly to X rays and showed that cells took on certain new histological features, which continued for some time after the X ray exposures were stopped.

From the method of experiment which has been used in the series described here, it is evident that the acquired resistance must be attributed to some action of the X rays upon the cells of the tumour or its stroma. There is a distinction to be noted between the clinical conditions of Nogier and Regaud's observations and the experimental conditions here. In the former the tumour which received the first doses of X rays became resistant to the rays when applied later; no doubt many of the original tumour cells were present in this later stage. By the experimental method of transplanting a fragment of the tumour and waiting for a tumour of considerable size to grow before irradiating it, we are dealing, at each stage of the experiment, with cells many generations removed from those which have actually received the rays. In spite of this, the degree of acquired resistance is very considerable.

Microscopic Examination.

In order to see whether any histological changes were detectable in the tumour cells which had acquired this slowness of growth and increased resistance to X rays, they were examined microscopically. Sections of the normal rat sarcoma and of tumour which had grown after an exposure lasting 135′ (Expt. 6) were mounted on the same slide and kindly examined for me by Dr. E. B. Krumbhaar, who knew nothing about the identity of the specimens. He reported no appreciable differences between the two sections. When the irradiation period was extended to 180′, Expt. 6 shows that very small tumours persisted for some time, but did not continue to grow; one of these was excised and sections mounted on the same slide as those of the normal sarcoma. Dr. Krumbhaar's report reads as follows:—

"A section about 4 mm. in diameter (irradiated sarcoma): There is a general concentric arrangement of tumour tissue, which is well circumscribed and surrounded by fat and fibrous tissue. Within the nodule are many large bodies of various kinds; either giant cells (with a single eccentric nucleus) healthy or in various stages of degeneration or quite structureless bodies (apparently degenerated giant cells). Empty spaces apparently denote where these bodies have dropped out or in some places are dilated lymph spaces or fat. The body of the nodule consists chiefly of spindle cells and coarse collagen, somewhat separated by edema fluid. The spindle cells are mostly sarcomatous with relatively few fibroblasts. Blood-vessels are not numerous and not altered. There is no cellular infiltration.

Larger section (untreated sarcoma): The tumour tissue, which is found immediately beneath the epithelium, is circumscribed, but surrounded by much more delicate fibrous tissue. The section is much more cellular, the cells stain much more sharply, and there is less collagen. No giant cells are seen, though there is considerable variations in the size of the sarcoma cells. The predominant cell is a short, fat spindle, with a large oval nucleus and finely divided chromatin. Another section shows tumour cells closely packed, with a very little collagen distinguishable."

Conclusion.

It looks, therefore, as if we can recognise by this method of irradiation a number of steps in the action which X rays have upon these tumour cells, beginning after moderate doses with a slowing up of its normal rate of growth; with greater doses the tumour acquires an increased resistance to the X rays. When doses very near to the lethal dose are given, degenerative features appear in the cells which can be recognised microscopically. Experiments are in progress to see whether other animal tissues are similarly influenced by X rays.

The radium employed in these experiments has been lent to the Middlesex Hospital by the Medical Research Council.

[1] Compt. Rend. Acad. des Sci., June 8th, 1914.

[2] Bulletin de l'Assoc. Française pour l'étude du Cancer, tome iv. 4 année.

THE METABOLISM OF COD-LIVER OIL BY DIABETICS.*

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(*From the Household and Social Science Department, King's College for Women.*)

THE problem of feeding diabetics, though undoubtedly alleviated by the discovery of insulin, is still difficult. To obtain for them a diet of even passable calorie value without the disadvantages of a glycosuria or an aceto-aceturia, is an undertaking. If we could find a fat which is metabolised along other routes than that of the keto-acids and does not, in avoiding that path, give rise to carbohydrate-like bodies, then it would be of immense value. The possibility of the unsaturated fats emerges. Leathes [1] has suggested that the undoubted manufacture of unsaturated fats by the animal body, probably in the liver, is a step in their metabolism to enable them to be more readily oxidised later. He compares it with the drying of gunpowder.

The easiest to obtain is, of course, cod-liver oil. This oil already has advantages over butter in having a higher calorie value, weight for weight, and a greater vitamin-A content. There is evidence that some di-basic organic acids [2] do not give rise to aceto-aceturia in diabetics, and also that some unsaturated fatty

* The expenses incurred in this work were defrayed by a grant from the Medical Research Council, to whom my best thanks are due.

[1] THE LANCET, 1909, i., 583.

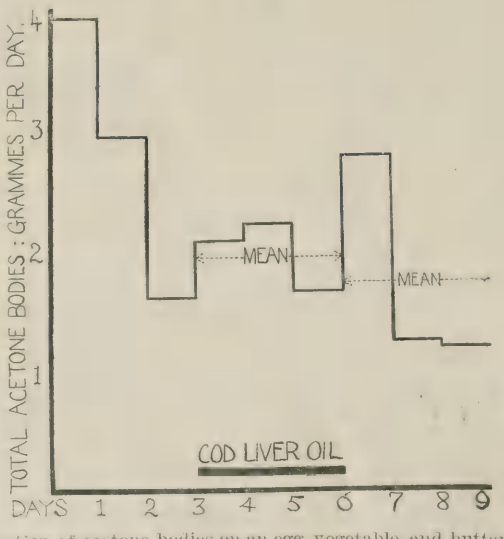
[2] Baer and Blum: Arch. f. Exper. Path. u. Phar., 1906, lv., 89; 1907, lvi., 92; 1911, lxv., 1.

acids[3] behave similarly. There is a possibility that the fatty acids of cod-liver oil would, on metabolism, yield di-basic organic acids. On the other hand, the first stage in the oxidation of the unsaturated acid appears to be the formation of the saturated fatty acid.[4] Consequently, in view of the value of fish oils and fatty fish in dietetics, experiments were put in train to discover the path of metabolism followed by unsaturated fatty compounds in the diabetic organism.

With the kind permission of Prof. F. R. Fraser, and the coöperation and advice of Dr. George Graham, I was allowed to substitute cod-liver oil for butter in the diet of diabetics in the Sandhurst Ward of St. Bartholomew's Hospital, when they were at the stage of receiving an egg and vegetable diet with 25 or 50 g. of butter. Either the acetone and the aceto-acetic acid were measured iodometrically, or the total acetone bodies were estimated by v. Slyke's method. The latter method was preferred, for the former, while often giving beautifully concordant results, would, in spite of all precautions, with urine which had been preserved for a while, give most anomalous results. Nothing short of a 1 per cent. agreement in parallel estimations has been accepted.

The result is briefly this, that when the butter of the diet—25 or 50 g. respectively—was replaced by 1 or 2 oz. of cod-liver oil in the form of a 50 per cent. emulsion, there is no evidence that the fat of the cod-liver oil is metabolised along other lines than those of butter. Unsaturated fats follow the same path as saturated fats. Consequently, the unsaturated fats in herring, sprats, salmon, or sardines, in the feeding of diabetics, must stand on their merits of high calorie value and vitamin-A content, rather than any antiketogenesis of their metabolism.

The accompanying curve perhaps best demonstrates this. The patient was on a diet of egg, vegetables, and



Excretion of acetone bodies on an egg, vegetable, and butter diet when the butter was temporarily replaced by cod-liver oil.

50 g. of butter per day, and making good progress. The total acetone bodies for three preliminary days were estimated, then for three days when the butter was replaced with a rather more than an equivalent amount of cod-liver oil, and finally, for three more days on the original diet. As will be seen, there was a slight rise on the first two days of cod-liver oil, followed by a fall to the original amount. The first day after the removal of it from the diet there is a rise, followed by a fall to a still lower point. Should anyone wish to argue from this curve that the removal of the cod-liver oil from the diet removes an anti-ketogenic substance from the diet, other curves could be adduced in which the opposite occurred. A more reasonable explanation is that the amount of ketosis in this patient was diminishing owing to his steady increase of power in metabolising carbohydrate, and that the ups and downs are variations due to chance. The mean excretion of acetone bodies during the cod-liver oil period was 1·93 g. per day, and in the succeeding three days 1·72 g. There is no evidence here or in other experiments that the metabolism of cod-liver oil pursued a different path from that of butter.

[3] Schwartz: Arch. f. klin. Med., 1903, lxxvi., 233.
[4] Dakin: Oxidations and Reductions in the Animal Body, 1922, p. 48.

Clinical and Laboratory Notes.

UNUSUAL VARIETIES OF CALABAR SWELLINGS,

WITH A NOTE UPON THE ÆTIOLOGY OF THE CONDITION.

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IN 1911, in a paper entitled Filaria Loa,[1] I described a rare form of Calabar swelling involving the hand and the whole of the forearm. Since that date, till the other day, I have not encountered such a case again, though Dr. P. Manson-Bahr tells me that he saw one a little time ago. Calabar swellings, as is well known, are connected in some way with *Filaria loa* infections and take the form of painless, non-inflammatory, white, waxy-looking, œdematous, solid swellings, usually about the size of a pigeon's or goose's egg. They last from two or three days to a week and gradually disappear of their own accord. They may occur on any part of the body. In the rare diffuse form to be described the swelling implicates the whole hand and forearm, the characteristic features of the localised swelling being present, however—viz., the peculiar white waxy-looking appearance, absence of redness, the solid nature of the œdema, not definitely pitting on pressure, painless—apart from the distension of the part—apparently causeless in origin and disappearing again of its own accord.

The following is the history of the case in question:

Patient born in England. Went abroad first in 1900 to Sierra Leone, South Africa 1904–1906, Nigeria 1911–1916, Cameroons 1914–1915, German East Africa 1916–1918, Northern Nigeria 1918–1923.

Previous Illnesses.—Malaria, dysentery (German East Africa).

Present Illness.—Swelling of right hand, slight, February, 1923. Again April, 1923, then clear till Dec. 16th, 1923, when right hand and whole of right forearm swelled up. Board-like swelling, no redness, no inflammation.

Condition on Examination.—I saw the condition on Dec. 28th, 1923. Very typical of the usual Calabar swellings—white, no redness, consistence pretty solid, difficult to pit on pressure. Extends up from hand, all of which is swollen, to elbow. No pain; just the discomfort of the tense feeling. Patient unable to move fingers properly.

On Dec. 31st I saw the patient again; swelling going down slowly. A slight papular condition present. Papules white, not red. No itching or special discomfort.

Blood Count.—Leucocytes 9000. Differential count: Polymorphonuclears 35, large mononuclears 4, lymphocytes 24, eosinophils 37 = 100.

On Jan. 7th, 1924, the swelling was slowly going down. On the 14th it was practically gone.

The photograph illustrates the condition. A point of interest is the time the condition lasted—viz., about a month. Small swellings are usually gone in a week or ten days.

Another rare form I wish to describe is that where the penis is attacked. I recently saw a good example of this in a patient who had already suffered from several Calabar swellings in different parts of his body. Long experience of such swellings enabled me to say at once what it was and to prognosticate that it would disappear in a few days of its own accord.

[1] Journal of Trop. Med. and Hyg., Jan. 2nd, 1911.

which it did. Another case showed the whole of the hand considerably swollen, especially in the dorsum, with no implication of the forearm.

Etiology of the Condition.

In the *Journal of Helminthology* (1923, i., 191) I described the result of puncturing such a swelling, and looking for filarial embryos, on Sir Patrick Manson's assumption that the swelling might be due to a female worm giving birth to young ones. I definitely proved that this was not the case, and then threw out a suggestion that the cause might be due to the death of a worm with an escape of toxin or from some poisonous product of decomposition.

I have now collected some very strong presumptive evidence that such is the case. In the patient just

Calabar swelling implicating whole of right hand and forearm.

mentioned, who suffered from a Calabar swelling of the penis, I noticed as the swelling went down a small nodule which felt exactly like a coiled-up worm. I consulted at once with a surgeon upon the advisability of cutting down and removing this, but he was afraid of hæmorrhage from the corpus cavernosum, on the surface of which the mass apparently lay, while the patient—probably rightly so—refused absolutely to have any surgical interference. I had to content myself then with daily manual examinations. The little mass grew less and less and finally disappeared a considerable time after the general swelling had subsided. I believe then, that in this instance a worm had died: and in doing so had set free some toxic substance, which caused the œdema and so produced the Calabar swelling. Occurring as it did in the soft tissues of the penis, one was able to detect the little coiled-up mass, of what I took to be the worm, and which one would almost certainly have missed if it had been in the ordinary solid connective tissues. It is highly probable, then, that this is the explanation of the ætiology of the peculiar solid œdematous swellings known as Calabar swellings.

There is really nothing against the idea, nor does the fact that the patient may have many Calabar swellings militate against it, because we know from autopsies that infections with 20, 30 or more adult worms are not uncommon. *Filaria bancrofti* in dying, we know, often give rise to inflammation and even to septic troubles eventuating in abscess formation. *Filaria loa*, on the other hand, apparently give rise to localised œdematous swellings of an angio-neurotic nature.

A NOTE ON VERTIGO.

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IN cases of vertigo the examiner has such a wide field of origin to choose from that any factor which appears frequently in such cases becomes at least of academic interest: and after this factor has been submitted to scrutiny by competent authority its place is established according to its value. In a paper which I read before the Academy of Medicine in New York,[1] I made a list of causes of aural vertigo; the past decade has modified my views considerably, but I quote the grouping as I then presented it.

Aural Vertigo.

Section I.—Peripheral causes: (*a*) Chronic progressive middle-ear deafness; (*b*) hæmorrhage into labyrinth and embolism: (*c*) traumatism.

Section II.—Aural vertigo due to altered state of blood pressure: (*a*) increased blood pressure: and (*b*) diminished blood pressure.

Section III.—Aural vertigo due to general systemic causes: (*a*) leukæmia: (*b*) occasional: (*c*) with ocular symptoms; (*d*) specific; (*e*) cerebral anæmia.

This classification fails, especially when one is dealing with extra-aural cases, the more important of which were considered by Dr. Gordon Holmes in the discussion on Vertigo at the Royal Society of Medicine on Feb. 26th last.[2] The most important clinical feature of the majority of cases which I have seen in private and hospital practice, however, is that in Section II.(*b*), since 1912 I have made a point of ascertaining the blood pressure of these patients. The result certainly astonished me; a low blood pressure was so common. The frequency with which I found that something was apparently acting as a depressant upon the heart's action was also unexpected. I would go so far as to say that a, if not the, principal agent—i.e., in-patients with a normally low blood pressure and over 15 years of age—was tobacco.

The action of a low blood pressure upon the function of equilibrium is central and may be severe, embolic; transitory, or anæmic in its effect. In the severe form the vertigo is accompanied by deafness, which may be capable of improvement. In the less severe or transitory form I usually find that removal of the exciting cause and administration of remedies calculated to restore the blood pressure to normal is sufficient to prevent recurrence of the symptoms. A very interesting example of the effect of the blood pressure in producing vertigo is the following: A lady, aged 69, consulted me for vertigo, stating that she had been under a heart specialist for very high blood pressure, which he had reduced to 140. The vertiginous attacks were coincident with this reduction. Allowing the blood pressure to increase somewhat put an end to the attacks.

I have no record of high blood pressure as a cause of vertigo, although it is quite commonly present in cases of tinnitus in the middle-aged. Amongst other cases I have seen, syphilis has been fairly frequently present.

[1] THE LANCET, 1912, ii., 1638.
[2] THE LANCET, March 1st, p. 445.

LIVERPOOL NEW MATERNITY HOSPITAL.—Princess Mary Viscountess Lascelles visited Liverpool on March 12th to lay the foundation-stone of the new Maternity Hospital. The site for this hospital has been presented to the city by the late Sir William Hartley, together with a sum of £25,000, to which a further sum of £27,000 has been added by voluntary subscriptions. The site is conveniently placed near all the academic buildings of the city, and the erection of the new building is to be begun at once. The hospital aims at being a complete modern building to accommodate 90 patients, with facilities for increasing the number of wards as funds permit. Amongst those presented to Princess Mary, before the luncheon at the Town Hall given by the Lord Mayor and the City Councillors, were three members of the honorary medical staff, Dr. J. E. Gemmell, Dr. J. H. Willett, and Miss Frances Ivens. In the afternoon a visit was paid to the present maternity hospital on Brownlow Hill.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

POSSIBLE SUBSTITUTES FOR COCAINE.

A GENERAL meeting of the Society was held on March 12th under the presidency of Sir WILLIAM HALE-WHITE, when a debate was held on this subject.

Dr. H. H. DALE, in introducing the discussion, said it might seem strange that the question of replacing cocaine by artificial substitutes had not arisen in relation to other alkaloids which also were dangerous drugs of addiction, but in some respects the case of cocaine was unique. The effects of cocaine after absorption complicated its use in medicine and surgery by producing undesirable symptoms. Theoretically it was not impossible that a substance might be found having the valuable properties of cocaine without its harmful ones. He proceeded to consider the various substances which had been put forward as substitutes for cocaine, with the idea of discovering how far any or all of them together could fulfil its functions and avert its dangers. He enumerated the list of properties of cocaine.

1. It had a powerful and long persisting local anæsthetic action, with penetrative capacity in the tissues, so that it could produce anæsthesia of relatively deep structures.

2. When locally applied to a mucous membrane it caused constriction of the small blood-vessels, producing ischæmia and deturgescence. It also had a mydriatic action.

3. It showed but little tendency to irritate or devitalise the tissues in the area it was injected into.

Its undesirable properties were :—

4. It was somewhat unstable ; solutions of cocaine could not be sterilised by boiling without danger of hydrolysing it into benzoic acid and methylecognine, when its local anæsthetic action became destroyed.

5. It was dangerously toxic when absorbed into the general circulation, and this limited its use for producing anæsthesia by injection. And, unless only small quantities of dilute solutions were used, its application to intact mucous membranes was not without danger. There ensued a primary stimulation of the brain, with acceleration of cerebral processes, loss of sensation of fatigue, and a feeling of well-being and euphoria. Following this were restlessness and garrulity, accelerated respiration and heart-beat, a rise of arterial blood pressure, and a heightened temperature. A further stage was depression, collapse of blood pressure, slow and feeble heart-beat, loss of consciousness, and if death ensued it was from paralysis of the respiratory centre.

6. The primary stimulant effect of a dose which was not immediately dangerous was apt to leave a desire, in a person of weak control, for a repetition.

Of the substitutes which had been put forward to replace cocaine, he spoke only of those which had had some measure of success, omitting also such substances as orthoform and anæsthesin, which were suitable only as analgesic dusting powders. Of the eucaines, only β-eucaine had had practical success. He also dealt with tropacocaine, stovaine, alypine, novocaine, and butyn. In intensity and persistence of local anæsthetic action, cocaine seemed to stand unrivalled, excepting only butyn. Novocaine was much more rapidly destroyed in contact with the tissues, so that it did not penetrate deeply. Tropacocaine some regarded as equally active with cocaine in local application, but it was more evanescent. He hoped to hear more of the anæsthetic efficiency of butyn.

For none of the suggested substitutes was it claimed that they resembled cocaine in constricting the blood-vessels and producing shrinkage of mucous membrane. Had any of the available substitutes a like action, or could it be produced by locally mixing the anæsthetic with a suitable proportion of adrenalin ? And was the mydriatic action of cocaine considered important by ophthalmologists ? All the suggested substitutes seemed to be more stable than cocaine to boiling in watery solution, and most of them possessed less general toxicity than cocaine, though to this alypine seemed to be an exception. Eucaine, tropacocaine, stovaine, and novocaine were much less liable than cocaine to produce bad symptoms if absorbed into the general circulation. Butyn seemed to be even more toxic than cocaine judging by animal experiments ; yet in human therapeutics there had been an absence of bad symptoms from accidental absorption. The substitutes which had sufficient potency and penetration had the drawback of irritating and devitalising the tissues, while novocaine—ideal in this—was deficient in power and persistence. By choosing for each separate purpose the appropriate substance cocaine had been largely replaced by safer substitutes. For infiltration-anæsthesia and for nerve-blocking most needs were filled by novocaine. For causing analgesia by intrathecal injection, stovaine and tropacocaine had been largely used. When speaking of less dangerous substitutes he explained that he had in mind not only danger of immediate toxicity, but the more subtle danger of addiction. The problem created by the cocaine habit had led the Ministry of Health to appoint a special committee (of which he was a member) to discuss the question, and the terms of reference were, "To investigate the comparative value for therapeutic purposes for which cocaine is at present used, of various possible substitutes, and the evidence as to risk, if any, of such substitutes becoming drugs of addiction." He had failed to elicit evidence of a case of addiction to any local anæsthetic other than cocaine. Still, he would be interested to learn whether any of the substitutes had been found to produce a mental exaltation and euphoria comparable to that produced by cocaine, and providing the basis for its habit-forming property. A further important question was that of the extent to which the proper use of cocaine in medicine and surgery involved the danger of producing the drug-habit. This included the question of what was the proper use of cocaine. He thought cases in which the use of cocaine by the patient, on a prescription, for application had resulted in the formation of a vicious habit were rare. He expressed himself as very interested to know whether a single application of cocaine by the medical man himself had ever been known to result in the patient acquiring the habit. If not, the further question arose whether cocaine itself was indispensable for any other purposes, or whether those other uses could be met by one or other of the substitutes. Would medical practice in any direction be materially hampered if the use of cocaine were limited to direct application by the medical man himself, with prohibition of dispensing or prescription for the patient ?

In conclusion, he said that, under the title of the discussion, the only practical question was whether any of the possible substitutes, or all of them together, so far fufilled the functions of cocaine that medicine and surgery could do without the latter. No negative answer to this question could at the present time be final. Synthesis of the drug had already resulted in a series of isomeric cocaines being produced. A wide synthetic field still remained to be explored, and there was always the possibility that from the research would emerge the ideal local anæsthetic, potent, penetrating, astringent, and free from immediate toxicity or habit-formation. If no efficient substitutes were yet available the question needing an answer was, could the use of cocaine in the profession be so restricted as to minimise its dangers without real detriment to practice ?

A Resolution Withdrawn.

The PRESIDENT mentioned that Dr. Dale had suggested that the meeting might like to pass a resolution on the matter, and if so, it would be wise to bring it before a fairly full meeting, as many might have left if it were deferred until later. The suggested wording was : "This meeting, while regarding the retention of cocaine as essential to medical and surgical practice, is of opinion that its use might with advantage be restricted to the application by the physician or surgeon himself, and the prescription or dispensing of it might be abandoned."

Prof. W. E. DIXON proposed this, in order to open the discussion.—Mr. H. J. BANKS-DAVIS seconded.

Mr. N. BISHOP HARMAN moved to add "except when prescribed in such vehicle, or with such other

drug, as to prevent its use for purposes other than that intended."—Mr. MARK HOVELL seconded this.

Mr. HARMAN, in support of his addition, said it was possible to prescribe cocaine in castor oil.—Mr. ERIC WATSON-WILLIAMS said he thought it was a startling thing that any action should be taken to limit the discretion of a physician or surgeon in prescribing anything he thought fit for use.—Dr. W. HILL deprecated passing anything like a panic resolution.—Dr. DALE interposed that it would be better to withdraw the resolution than to put it to the vote and have it rejected.

The proposal was then withdrawn by the PRESIDENT on the ground of due notice not having been given.

Discussion.

Prof. W. E. DIXON said it was remarkable that up to the present time no alkaloid had been produced synthetically superior to those provided by nature. But there was more hope with cocaine, because its action was essentially one on the central nervous system, the local anæsthetic effect being, in a sense, an accident. Montigazza spoke of the effect of chewing coca leaves as that of producing unspeakable beatitude. On two occasions the speaker had had 1½ gr. of cocaine injected into himself; and the only effects were some tremulousness and excitement, slight frontal headache, and wakefulness, and no desire to repeat the experiment. The effect did not differ materially from that following the injection of 4 or 5 gr. of caffein. Mariani, who popularised cocaine in Europe, gave some to Pope Leo XIII., and His Holiness presented the giver with a gold medal to show his gratitude for a medicine which so assisted him in the practice of his asceticism. A local anæsthetic was a general protoplasmic poison. β-eucaine, tropacocaine, and stovaine were now generally regarded as not satisfactory, because in the doses necessary to produce anæsthesia they also caused some irritation of other tissues. Eucopenal toxin was 20 or 30 times as powerful as cocaine, but it was useless in medicine because in very minute doses it not only destroyed the nerve fibres, but injured other tissues; it had not sufficient selective action. Local anæsthetics acted by paralysing sensory nerve-endings; and in the case of a mixed nerve they paralysed the sensory fibrils before the motor. Heroin had been introduced 15 years before a case of addiction was described, despite the fact that it was an ideal drug of addiction. The bowels of the morphine addict worked about once a week, but the heroin addict was almost normally regular in that respect. He thought that before the war cases of cocaine addiction must have been very rare. The habit started around the lines in France, thence it spread to Paris, to London, and, much later to Berlin. Men engaged in the war were in a highly emotional state when they came away from the conflict, and the mental exaltation caused by the drug seemed to bring to them the relief they craved. Yet they did not want to repeat it for a number of days. Since the war, however, cocaine snuffing had become more general. Dr. Copeland had been working a good deal at butyn; this exerted a stimulant action on a portion of the brain cortex, and its effect was temporary. After a time there followed a mild degree of depression. Butyn also temporarily paralysed, in relatively small doses, the nerve ganglion cells throughout the body. The cells in the autonomic system remained paralysed for from five to ten minutes. One objection which had been made to butyn was that it promoted free secretion; if absorbed there was great salivation, and when put into the eye the lacrymal gland secreted freely. Sometimes butyn did not act, and the reason, he thought, was that it was precipitated by even very weak solutions of common salt. Added to egg-albumen it caused a white precipitate. In the nose strong solutions of butyn paralysed the sympathetic nerve-endings.

Prof. C. S. GIBSON uttered a strong plea for more chemical research on this subject, on the lines so successfully carried out by Mr. Fourneau, in Paris, who synthesised stovaine, alypine, and some others. But this work, to yield its full benefit, must result from the collaboration of the chemist with the physician and the pharmacologist. He could not see what special advantage there could be in butyn over novocaine. Butyn compounds were capable of existing in optically active form, but the compounds which had been tried clinically had been only in the inactive form. The ideal cocaine substitute must be an optically active compound. Another part of the investigation was the stereo-chemical examination of these compounds. Dr. King had recently been investigating the stereo-chemical properties of β-eucaine and iso-β-eucaine, and Dr. J. H. Burn had arrived at the conclusion that the anæsthetic action of those compounds, whether optically active or not, was approximately equal. But he (Prof. Gibson) did not think that invalidated the necessity for a more complete stereo-chemical investigation of all the possible substitutes for cocaine. The most successful line of research, however, would be the synthesis of a compound on a cocaine model. Synthesis of cocaine had been achieved, and there was no difficulty about repeating it. The naturally occurring cocaine was levo-rotatory; the product synthesised in the laboratory was optically inactive. Yet no one had succeeded in resolving the synthetic cocaine so as to try and see whether dextro-cocaine might not be a desirable cocaine substitute. The most useful line of research would be to start from the cocaine model and build up as many compounds as possible, then to start a stereo-chemical investigation in addition, getting the pharmacologist to evaluate these drugs, which could then be handed over to the clinician.

Mr. T. B. LAYTON said the drugs under discussion were of interest to him solely in the light of surgical technique. Local anæsthetics were a means of replacing general anæsthesia by something more efficient, more safe, and more pleasant. He believed the future of rhinology was intimately wrapped up with the subject of local anæsthesia. Thus the need of a good and safe local anæsthetic was very great. In the matter of producing shrinkage he believed that when adrenalin was added to the local anæsthetic the latter was not quite so valuable as without it. He thought the clinician should tell the laboratory worker what he wanted, and that new drugs were really needed, though whether they would efficiently replace the present ones was matter for discussion. There were many gaps in the series investigated and when those gaps had been filled the ideal drug might emerge, one which had the advantages of cocaine without its disadvantages. It was the minor degrees of toxicity with which the clinician was concerned. When dealing with a patient and giving him drugs he found it almost impossible to say which symptoms were due to the drug and which to the anxiety and apprehensions of the patient who was about to endure an operation on the nose.

Mr. F. N. DOUBLEDAY, speaking as an odontologist, referred to the British Dental Association's questionnaire to the dental surgeons of the country, which showed that three-fourths of those who replied thought cocaine was essential for dental work, while the remaining one-fourth, comprising men connected with various dental hospitals, thought cocaine was not necessary, as efficient substitutes for the purpose had been found. He believed medical men had not yet appreciated how valuable dental operations could be as affording a clinical test of the relative value of the various substitutes for cocaine which had been suggested. He hoped Dr. Dale, in his reply, would say whether the manner in which the sub-groups of atoms were brought into the molecules made any difference to the properties of the substance. He had recently tried various anæsthetics of the eucaine group, and he found many of them very irritating, though they did not cause much pain. If local anæsthetics came into contact with alkaline water, or lysol, many of them were precipitable, and their chemical character was thereby much altered. For dental purposes novocaine could be proved to be an efficient local anæsthetic.

MR. S. F. ST. J. STEADMAN agreed that novocaine was an efficient anæsthetic. One drawback in the substitutes was the occurrence of after-pain. That could be minimised by using fresh solutions. Butyn, which he had used in 200 cases, did not produce anæsthesia quicker than did ordinary novocaine, and in some cases the after-pain of butyn was very severe, sometimes lasting as long as three or four hours. By the use of freshly distilled water the after-pain from a local anæsthetic was less than after nitrous oxide gas.

MR. ERIC WATSON-WILLIAMS (Bristol) spoke of published cases of cocaine addiction before the war, and said that between 1888 and 1895 cocaine was used largely in the treatment of morphine addiction. Clinically, the real objection to cocaine was its toxicity. Figures of comparative toxicity had been published, based upon animal experimentation, but the limitation of the latter as a parallelism to human experience should always be remembered. Butyn, he considered, gave a perfect anæsthesia. All the substitute drugs were dangerous unless used with great care, hence the equipment of the clinician should be as simple as possible. The real objection to cocaine lay in the fact that it was poisonous, and in this respect the substitutes did not differ. There seemed to be a definite relationship between the toxicity and the anæsthetising power. Clearly, a local anæsthetic must be a substance with a special affinity for nervous tissue. If feasible, he thought experiments with these drugs on apes would yield the most dependable guide for man. He laid special emphasis on the question of the concentration of the drug in its relation to the toxicity. In cocaine, for example, in concentrations above 2 per cent., especially above 5 per cent., the toxicity was not very materially affected by variation in the concentration, but in larger dilutions the toxicity of the same gramme of cocaine fell rapidly. The importance of this lay in the fact that clinically only the dilute solutions were injected. By sufficient dilution a point was reached at which the drug was entirely non-toxic, and for cocaine this point was probably below the limit of clinical usefulness. In the case of novocaine, with adrenalin added, it was near ¼ per cent.—i.e., it was impossible to administer subcutaneously a dose of novocaine which would kill a guinea-pig. Perhaps it was along this line that a solution of the problem would be found.

MR. FRANK COLEMAN said he knew of no anæsthetic which was so efficient as cocaine for the removal of tooth pulps. The public spoke of local anæsthesia as if only one drug was used to produce it, cocaine, and after an operation patients frequently expressed surprise at the absence of pleasurable sensation following the injection. He believed cocaine could be sterilised if boiled in a vessel which did not contain alkali.

Reply.

DR. DALE, in reply, said it was shown some time ago that novocaine, in whatever concentration it was injected, seemed, by hypodermic injection, to be very much less toxic than cocaine, but if the injection were done directly into the blood-stream the contrast was much less striking. Novocaine was apparently either very rapidly eliminated through the kidneys, or was quickly hydrolysed into inert compounds when it got into the blood-stream. Butyn appeared to be a more stable substance. He spoke of a new local anæsthetic he was soon to have an opportunity of trying privately, in which he would seek the collaboration of some of his colleagues. He spoke hopefully of the prospects of a suitable substitute being eventually found.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.

A MEETING of this Association was held on March 11th, Miss CHADBURN, the President, being in the chair, when papers were read on

Anæsthesia and Anæsthetics.

DR. H. N. PAYNE, discussing general anæsthesia, said that she preferred ether to chloroform or chloroform mixtures, on grounds of easy administration and safety. Patients much preferred induction by gas, and this was the routine method used by her, followed by closed ether. For toothless patients in the Trendelenburg position, in the late stages of long operations, in abdominal cases where the patient was acutely ill, and in thyroid operation she preferred the open method. She gave chloroform only to patients who appeared unsuitable subjects for ether, on grounds of chest complications, age, or stoutness. It was not her practice to give scopolamine and morphine before an anæsthetic, and she gave atropine only in selected cases.

MRS. A. GILLIAT, speaking on anæsthetics for ear, nose, and throat operations, explained how the technique had to be adapted to meet special difficulties caused by liability to an obstructed air-way. Anæsthetics for ear operations were less difficult than for those on nose and throat. The use of open ether was not altogether satisfactory, and she preferred induction with chloroform or C.E. mixture. She gave details of the technique employed in her practice for mastoid and lateral sinus operations, for operations on the nose, and for guillotine and dissection and enucleation operations on the tonsils in children and in adults.

MRS. TINDAL-ROBERTSON discussed spinal anæsthesia. This method was useful in cases of operation at the level of the umbilicus or below, especially in asthmatic or bronchitic cases, or for those with certain heart diseases. For prostatectomic operations on stricture of the urethra and for amputations in cases of diabetic gangrene it was the method of choice. Cases of Wertheim's operation and excisions of rectum did better under spinal anæsthesia combined with twilight sleep or general anæsthesia. The injection of stovaine was liable to cause a fall of blood pressure which might be dangerous when the patient was badly shocked before the operation. Where the patient was not shocked to begin with, spinal anæsthesia diminished shock. In spinal anæsthesia given by modern methods it was considered essential that the patient should not be allowed to get frightened. A patient who had had injections of hyoscine, morphine, and atropine before being brought into the theatre was already drowsy or almost asleep, though she could be aroused, and if all unnecessary noise were excluded she remained asleep. If the operation were delayed or the patient difficult, very slight chloroform inhalations would be sufficient to put her to sleep. Mrs. Tindal-Robertson dealt with the technique of injections, and then with certain complications which might arise.

DR. ENID MOORE described the technique of gas and oxygen anæsthesia, laying stress on the need for slow induction. For the alcoholic patient, introduction of ether vapour into the mixture was desirable. At the Infants Hospital, Vincent-square, gas and oxygen was used exclusively for abdominal operations, and the statistics appeared to show fewer fatalities than did other methods; especially in cases of congenital pyloric stenosis was it of value. Since an infant was liable suddenly to become deeply anæsthetised without preliminary warning, it was wise to give a proportion of 1 oxygen to 2 nitrous oxide instead of 1 to 4, as in adults. Occasionally the introduction of small quantities of ether vapour appeared to be stimulating. For adults, gas and oxygen was useful in stomach operations, thyroid operations, head operations, Cæsarean sections, in bronchitic patients and heart cases other than those with myocardial degeneration. Finally, Dr. Moore pointed out that vomiting might occur during operation when anæsthesia was too light or too deep and the narrow intermediate limits had to be observed.

MRS. MARGARET BRADY, speaking of ethyl chloride anæsthesia, said that she used the Loosley apparatus for closed administration, which she demonstrated.

Administration was not difficult, and proved a useful half-way house between nitrous oxide and chloroform. The advantage for dental anæsthesia in children was that the child had to come up once only, instead of several times, for a multiple extraction. Caution was needed, since ethyl chloride was a quick anæsthetic. Change in respiration was, in the speaker's experience, far the most useful of the signs to watch. Another danger sign was change of colour, especially to a waxy pale colour. The drug had a cumulative effect, and it was not wise to push its administration till the pupil was fixed, central, and dilated. The lessening rigidity of the jaw muscles was a useful practical sign of increasing depth. The only fatalities known to Mrs. Brady were caused by administration of a second dose, at the request of the surgeon, during the same operation and she strongly advised that this should never be attempted.

Miss L. ALDRICH-BLAKE spoke of anæsthetics from the point of view of the surgeon and of the patient. From the patient's point of view, the two most important things were that an anæsthetic should be (1) safe, (2) as little unpleasant as possible. Nearly all patients disliked the smell of ether, and therefore induction by gas or some other method was an advantage, both to the patient and the surgeon. In the future, probably a combination of local anæsthesia and some less toxic form of general anæsthetic than was in routine use at present, would be the rule. She had found the injection of 2 per cent. novocaine into the muscles and planes of the abdominal wall, and into extra-peritoneal tissue in the rectum, very useful in diminishing shock. From the surgeon's standpoint, where good relaxation was required, to obtain and maintain the free airway was the first essential. Miss Aldrich-Blake quoted statistics from the records of consecutive patients operated on by her at the Elizabeth Garrett Anderson Hospital to show that no appreciable risk from pulmonary complications after ether anæsthesia need be feared. Of 700 patients, only 12 had developed pulmonary complications which might possibly be attributable to the anæsthetic, none of them being fatal.

Dr. MINA DOBBIE spoke of the use of twilight sleep in general practice. She said that the advisability of twilight sleep during labour was still a matter of controversy, that many of the arguments used against it were the same arguments that were formerly employed against the use of chloroform. The method of producing it, the dosage, and the purity of the drugs, varied so much when twilight sleep first came into use that the arguments used then were at least out of date. Most of the conditions mentioned by Dr. J. S. Fairbairn in 1917 as special indication for its use had been given by early observers as contra-indications. For women nervous of pain this was an ideal method and was safe so long as it was remembered that amnesia and not analgesia should be aimed at. Dr. Dobbie traced the history of twilight sleep, and gave details of the technique of the three schools: (1) the single dose school, (2) the standard dose school, and (3) the individual dose school.

Mrs. E. HANDLEY-READ, speaking of anæsthetics for dental surgery, discussed the patient's common preference for an anæsthetic which would enable several teeth to be pulled out at the same time when necessary. This, when insisted on, entailed a general anæsthetic other than gas and oxygen. The disadvantages were the difficulty of obtaining a suitable firm reclining couch even in a nursing home, where such an operation should be done; the danger that a portion of tooth or debris might pass down the throat, the shock following multiple extractions, and the danger of leaving too many open sockets in a septic mouth. For gas a skilled administrator was desirable, the inexperienced were apt to take off the face-piece too soon. She did not trust closed ethyl chloride for children, but it was useful as an open method to produce unconsciousness and followed by gas. Mrs. Handley-Read discussed the merits of local and regional anæsthesia, both of which methods were now being increasingly employed by dental surgeons.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

AT a meeting of this Society on March 5th, Sir DAVID WALLACE, the President, in the chair, Mr. G. EWART MARTIN read a paper on the

Application of the Bronchoscope in the Diagnosis and Treatment of Certain Affections of the Chest.

He pointed out the apparent rarity of cases of foreign bodies in the bronchi in this country, as compared with other countries, and in particular America. The habit of American children of eating pea-nuts might in part explain this discrepancy, but he believed that the condition was more common than was generally supposed, and this was more recognised in America than here. In a visit to Dr. Chevalier Jackson's bronchoscopic clinic in Pennsylvania University he had seen six cases in which Chevalier Jackson had removed foreign bodies from the lower air passages, whilst in 15 years in the ear, nose and throat department of the Edinburgh Royal Infirmary a like number only of such cases was recorded. A résumé of these six cases was given. The diagnostic signs were largely clinical, and most commonly the signs were those of a localised bronchitis. Atelectasis might be present. Chevalier Jackson described an asthmatoid wheeze which he regarded as diagnostic, similar to the wheeze of asthma but drier, the pitch varying with the size, position, and shape of the foreign body. It ought to be possible to make at any rate a tentative diagnosis without the aid of X rays, and X rays themselves were not infallible, because the foreign body might be non-opaque. With regard to technique, distal lighting had been developed by Chevalier Jackson, and had rendered the procedure much easier. A general anæsthetic was never used. Mr. Martin then described the technique of the operation, and gave the indications for it.

Referring to bronchoscopic treatment of bronchiectatic abscess, Mr. Martin said that the operation was comparatively simple and the relief to the patient amazing. There was always some pus left in the cavity even after very successful postural coughing. This residual pus was first of all evacuated by means of the suction bronchoscope. The cavity was washed out with boric, then dried and painted with absolute alcohol. The alcohol apparently set up a slight irritation and enabled the walls to seal together. One aspiration and lavage was not sufficient, though Chevalier Jackson reported one case in which a single aspiration had effected a cure. He considered the case, however, to be one of idiopathic bronchiectasis. The disappearance of the fœtor which followed aspiration was a great boon to the patient, and the operation did not upset him in any way. For vaccine therapy a swab could be obtained direct from the affected area, uncontaminated by the various organisms usually found in the mouth.

Mr. Martin's discourse was illustrated by lantern slides, and was followed by a discussion in which the President compared bronchoscopy with cystoscopy, and pointed out how the incandescent electric light had made this so much more practicable. There also took part in the discussion Mr. J. S. FRASER, Dr. R. A. FLEMING, Mr. DOUGLAS GUTHRIE (who showed some slides), Mr. J. D. LITHGOW, Dr. C. W. SOMERVILLE, and Mr. J. H. GIBBS, and Mr. MARTIN replied.

Mr. JOHN FRASER read a paper on

Problems of the Treatment of Empyema in Children.

With reference to the incidence of the disease, Mr. Fraser said that in the Royal Hospital for Sick Children out of roughly 1000 surgical cases about 15 were cases of empyema. A more important fact was, however, that the vast majority of those cases were secondary to infection of the underlying lung, and he thought it of interest to attempt to answer the question—what proportion of acute lung infections ultimately develop empyema? He estimated that

out of 49 cases of acute broncho-pneumonia the percentage was 14, and of 336 of influenzal-pneumonia, 5·7, an estimate which corresponded with the figures of Mounetier. A possible explanation was that broncho-pneumonia affected the more debilitated child, and that empyema was but an indication of a general want of vitality. On the other hand, the wider distribution of the broncho-pneumonia offered a greater opportunity for spread to the surface. Another point of supreme importance in the progress and conduct of the case was the nature of the infecting organism. In 53 pneumococcal cases the mortality averaged 6·9 per cent., whilst in 17 streptococcal cases it was 24·7 per cent. In streptococcal cases adhesions were few and the effusion widespread, whereas in the pneumococcal cases adhesions were many and relatively stronger, so that the effusion tended to be limited. This point was of great importance in considering treatment, for stereotyped treatment was to be deprecated. Points to consider were (1) the general condition of the child, (2) the type of infecting organism, (3) were adhesions present to any extent between visceral and parietal pleuræ? (1) and (2) were easily decided. With regard to question (3) the type of infection gave an indication, but was not a certain guide, nor were X rays infallible. Valuable information could be obtained from the amount of intra-pleural tension. A large-bore aspirating needle connected with a water manometer was inserted into the pleural cavity. The pressure varied within wide limits according to the amount of fluid present, but on the average it registered about 100 mm. of water. The important finding, however, was the degree of oscillation. In the absence of adhesions the play was wide, whilst the movement-limiting effect of their presence resulted in the maintenance of a constant pressure with comparatively little variation.

Mr. Fraser went on to discuss the practical details of treatment. In a case where adhesions had been demonstrated the aim was to open freely into the abscess cavity, to evacuate the pus, and also masses of fibrin adherent to the pleura, to establish a *closed* drainage from the most dependent part of the cavity, and to close completely the original wound after disinfecting its edges. Details of the technique were given. Dr. Fraser found that the results were most encouraging. After a period varying from 20 to 28 days the post-operative pneumothorax had disappeared, and the lung expanded to fill the cavity of the chest. In streptococcal cases free incision, owing to the absence of adhesions, led to extensive collapse of the lung, often with fatal result. Aspiration was, therefore, practised for four or five days to permit of the formation of adhesions, after which a procedure similar to the above might be applied with a considerable margin of safety. Every care must be taken to avoid breaking down the adhesions. Mr. Fraser considered this method superior to any other yet evolved.

Various points in the technique were illustrated by lantern slides.

The subsequent discussion was opened by the PRESIDENT.—Mr. D. P. D. WILKIE referred to the work of the commission on post-influenzal empyema in American camps, from which it was concluded that the best results were obtained from aspiration. He also spoke of the method of aspiration followed by injection of an amount of 1/2500 gentian violet equal to half the aspirated fluid.—Mr. W. J. STUART spoke of a method of suction drainage by means of a Politzer bag, which he had employed in adults with success.—Dr. S. DAVIDSON spoke of the importance of knowing the type of pneumococcus, and suggested the value of serum injection after aspiration.—Mr. J. W. DOWDEN, Dr. FERGUS HEWAT, and Mr. JOHN STRUTHERS also spoke, and Mr. FRASER replied.

Exhibition of Cases.

Sir NORMAN WALKER showed a case of leprosy. The patient was an old woman who had been in Russia 30 years before, but had had no communication with Russians even by post since then. She had apparently been perfectly well up till three years ago. Treatmen by a vaccine prepared from one of the nodules by Colonel W. Glen Liston was instigated with rather remarkable result, as shown by comparison of the present condition with a cast of the arm made before the commencement of treatment. Films made from the nodules before and after showed a remarkable diminution of bacilli since treatment. Some 20 injections had been given.

Mr. GEORGE CHIENE showed a case of snapping hip in a girl of 15 successfully treated by operation, and Dr. JOHN EASON showed a case of congenital heart disease in a woman aged 24.

LIVERPOOL MEDICAL INSTITUTION.

A MEETING was held on March 6th, with Mr. G. P. NEWBOLT,[1] the President, in the chair, when Mr. HUGH REID read a note on an

Obscure Case due to Calculus

in the pelvis of an ectopic kidney situated below the brim of the bony pelvis. The case was seen by Mr. Reid while the patient was under the care of Mr. Thelwall Thomas in the Royal Infirmary. The patient, a man, had a history of cutting pain in the left lumbo-sacral region shooting towards the groin. He also had pain in the suprapubic region passing down the penis. Blood had been passed in the urine. The clinical findings were negative. Urine examination showed urea 1·97 per cent., a few blood and pus cells, and staphylococci. The X ray diagnosis was "stone in the bladder." At a cystoscope examination pus was seen coming from the left ureter and from this it was decided that the condition was due to a stone in a much dilated ureter, low down. An operation was performed by Mr. Thomas. A split-muscle incision over the left iliac fossa was made, the ureter was not found, and the kidney was then noticed to be placed entirely below the brim of the bony pelvis; the organ could not be brought out if its bed through the wound and the renal vessels were seen arising from the common iliac. The stone was felt in the pelvis of the kidney and removed. One month after the first X ray examination the patient was discharged with the wound healed after a normal convalescence. Mr. Reid exhibited a lantern slide of the X ray plate and gave a short review of the literature on the subject, together with an account of the embryology, clinical features, pathological changes, diagnosis, and treatment of ectopic kidneys.

Dr. MORRIS J. COHEN, who assisted at the operation, said that the presence of pelvic kidney was unsuspected. The right kidney was shown on the X ray plates in its normal position. The shadow of the pelvic bones would naturally obscure the outline of the left kidney. No pyelogram had been made. Recently he had seen a post-mortem of a female case in which the left kidney was fixed below the brim of the pelvis. In both instances the suprarenal bodies did not descend with the kidneys.

Dr. J. C. MATTHEWS read a note on two cases of

Hodgkin's Disease

showing the periodic pyrexia usually known as the Pel-Ebstein syndrome. In one of them the diagnosis of Hodgkin's disease had been confirmed by post-mortem examination. A condensed temperature chart, prepared on the lines suggested by Hall and Douglas, was shown. This showed a wave-length of about 21 days. The second case was observed over a much shorter period and showed a wave-length of about 14 days.

Dr. S. W. PATTERSON read a paper on 31 cases of the same disease. Having outlined the clinical features and pathological appearances of the blood-forming organs, he discussed the absence of any

[1] We recorded last week with regret the sudden death of Mr. Newbolt; an obituary notice appears on p. 626 of the present issue.—ED. L.

significant ætiological factor. Syphilis and tubercle were related to Hodgkin's disease only as secondary accidental infections. Three cases had been attending the skin department for chronic skin lesions, in one instance for six years, before severe symptoms of Hodgkin's disease appeared. The pathological changes in the liver and spleen had led by analogy with malignant disease to Hodgkin's having been regarded wrongly as a new growth affecting the blood-forming organs. Having regard, however, to the peculiar disturbances of temperature with remittances and big oscillations, the more or less progressive course ending in death, and the pathological appearances, the causative agent was likely to be parasitic.

Mr. J. T. MORRISON spoke of the uncertainty that prevailed as to the nature of the disease and even as to whether it was one disease or a group which was called lymphadenoma. In view of this he emphasised the importance of concentrating on what was known and of making the diagnosis as accurate as possible. He declared that no patient with an operable mass of glands in the neck should be condemned to the label lymphadenoma until a gland had been submitted to microscopic examination. In excluding tubercle this was most important. In regard to treatment, he declared that results of excision in early cases followed up by full courses of X ray treatment and arsenic were better than from any of these methods taken individually, and he pleaded for further trial of this plan.

Reviews and Notices of Books.

OPERATIVE SURGERY.

Covering the Operative Technique involved in the Operations of General and Special Surgery. By WARREN STONE BICKHAM, M.D., F.A.C.S., former Surgeon in Charge of General Surgery, Manhattan State Hospital; Instructor in Operative Surgery, College of Physicians and Surgeons (Columbia University). In six octavo volumes. London and Philadelphia: W. B. Saunders Company, Ltd. 1924. Vols. I. and II. Pp. 1726. 50*s.* net per vol.

THIS treatise on operative surgery, comprising in all nearly 6000 pages and 6300 illustrations, is most unusual in that it is the work of a single individual. Nowadays we are accustomed to systems of surgery and medicine, the results of the collaboration of a number of writers welded into a whole by a single editor. Here we have an immense work written throughout by a single author, free from overlapping, unevenness, and other short-comings of a collective system, and with uniformity of outlook and expression. The author can only have achieved this success by colossal industry and a tenacity which must surely have been strained almost to breaking point, when subjects in which he was not particularly interested had to be dealt with. The two volumes under review show no evidence of flagging in interest or effort. In the preface the author reveals the motives which led to the writing of such a book. It is intended to deal with operative technique alone, but the author does not over-rate the place of technique in surgery. He maintains that operations should be carried out with a consummate regard to technical detail, which should be unobtrusive to the onlooker. His object has not been to describe all the operations of surgery, but the work is almost encyclopædic; we find, for instance, four methods of performing the rarely undertaken operation of ligature of the innominate artery.

Vol. I. deals with general surgical technique, including anæsthesia, local and general, plastic surgery, amputations, and the excisions of bones and joints. Each operation has a systematic heading, consisting of (1) a description of the operative technique in a few words; (2) an anatomical designation of the structures involved; (3) the name of the surgeon or surgeons to whom credit is given for the invention or modification of the procedure. Each section begins with a general consideration of the region in question, including its surgical anatomy, while it is concluded by a paragraph labelled "comments." In this volume there are satisfactory accounts of the various amputations and excisions, whilst some subjects to which much space is not usually allotted are fully considered. Amongst these is the question of the selection of the amputation site in relation to modern protheses, a full description of artificial limbs and what can be expected from them, kineplastic operations, and paraffin injections. The section on plastic surgery is very good, but, curiously, there is no mention of the method of the epithelial inlay graft, developed so extensively by Mr. Gillies.

In Vol. II. are found operations upon the blood-vessels, lymphatics, and nerves, operations upon bones, muscles, fasciæ, tendons, bursæ, cartilage, and joints (excluding excisions), together with two large sections upon the brain and spinal cord. This volume contains a mass of information, an immense number of operations being described, some of which are but little practised, such as Jonnesco's excision of the cervico-sympathetic, and Cushing's ventriculo-abdominal drainage for hydrocephalus. It is almost hypercritical to note an omission, but in the section on the closure of persistent bone cavities, amongst the ten methods discussed, no mention is made of the use of a pedicled muscle flap, which is very satisfactory on occasions. The sections on brain and cord surgery are unusually good.

The author set himself the purpose of describing technique only. One could wish that he could have amplified this by more discussion of the relative merits of the procedures he describes. Where he departs from this self-imposed restriction, unfortunately too seldom, his remarks are always valuable. For example, the lymphangioplasty of Handley and Kondoleon's operation appear in succession as apparently equal competitors for the surgeon's serious attention; the turning down of a section of nerve to bridge a gap and the implantation of a graft rank equally with direct union after slow stretching or the transplantation of the nerve trunk so that it follows a shorter course.

The author might have been more eclectic, even while professing only to deal with technique. But it was a great conception to write without assistance a large work dealing with all branches of surgical technique; in execution it has reached a pitch of extraordinary success.

The Students' Handbook of Surgical Operations. By the late Sir FREDERICK TREVES, F.R.C.S., and JONATHAN HUTCHINSON, F.R.C.S., Consulting Surgeon to the London Hospital. London: Cassell and Co., Ltd. 1924. Pp. 552. 10*s.* 6*d.*

THIS fourth edition of a well-known manual has been revised and enlarged by Mr. Hutchinson. The task has been thoroughly carried out, as can be readily seen by references to such sections as those on the stomach and skull. The author justifies the devotion of so much space to amputations and the tying of arteries on the grounds that these subjects bulk largely at examinations, as they provide excellent and almost the only available tests of the candidate's skill and anatomical knowledge. There is a very great deal to be said for the view whilst examinations are a necessity, and these sections do not seem to be over-emphasised in the present volume; more drastic revision of them would have detracted from the value of the work. The book is so well established that a detailed criticism is not required. It is likely to remain one of the best students' manuals on operative surgery.

ASSYRIAN MEDICAL TEXTS.

From the Originals in the British Museum. By R. CAMPBELL THOMPSON, M.A., F.S.A. London: Humphrey Milford, Oxford University Press. 1923. Pp. 107. 42*s.*

THIS compilation presents in 107 large plates the carefully drawn facsimiles of the text of 660 cuneiform medical tablets, for the most part hitherto unpublished,

from the royal library of Ashurbanipal, now preserved in the British Museum. This library is almost the sole source of our knowledge of Babylonian and Assyrian medicine, and it was discovered in 1849 by Sir Austin Henry Layard in the course of his excavations at the Mount of Kouyunjik, opposite Mosul, the site of Nineveh, capital of the later Assyrian empire. The tablets, dating back to the seventh century B.C., are, as Mr. Thompson states in his preface, copies of older texts, as is obvious from the similarity of the medical tablets found at Askur, which are centuries older. The reproduced tablets, some of which are mere fragments, are arranged and indexed. No translations are included, but many of the texts are interpreted and systematised by Mr. Thompson in a paper, published in the Proceedings of the Royal Society of Medicine, 1924, Vol. XVII. (Section of the History of Medicine), pp. 1–34, of which reprints [1] are available. It is a little over ten years since the late Prof. Morris Jastrow of Pennsylvania lectured to the Royal Society of Medicine on the medicine of the Babylonians and the Assyrians, and his address [2] is still worth reading.

MODERN METHODS IN THE DIAGNOSIS AND TREATMENT OF GLYCOSURIA AND DIABETES.

Second edition. By HUGH MACLEAN, M.D., D.Sc., M.R.C.P., Professor of Medicine, University of London, and Director of the Medical Clinic, St. Thomas's Hospital. London: Constable and Co. 1924. Pp. 191. 12*s*.

THE fact that the first edition of this book was exhausted within a few months certainly justifies the view that it has been of service to the general practitioner. Opportunity has now been taken to add a special chapter on the properties and use of insulin. The discovery of insulin by Banting is described, and a short account is given of its preparation and standardisation. The effect of the drug on normal and diseased persons is discussed, together with the symptoms and treatment of hypoglycæmia. The type of patient with diabetes mellitus who needs insulin is described, and the necessity of making certain of the diagnosis before starting treatment is insisted on. Prof. MacLean is pessimistic as to the ultimate benefit which insulin will confer on patients, since with the old dietetic treatment patients who had done well at first relapsed afterwards. He expresses the opinion that insulin will do no more to cure diabetes than does thyroid extract to cure myxœdema. But no one outside certain irresponsible writers in the press has ever hoped that a real cure would be obtained, however great the improvement might be both in the clinical condition and in the recovery of sugar tolerance.

The general directions for the giving of insulin to patients are clearly set out, and certainly with their help there should be no symptoms of overdosage, even if no blood-sugar determinations are carried out. The importance of blood-sugar determinations is, however, pointed out. The observation that mild infections play an important part in lowering the sugar tolerance is well known, and must not be overlooked. The directions given for the treatment of coma are simple and good. The rest of the book has been little altered. In our review of the first edition we pointed out that references to some of the literature on the subject would add greatly to the value of the book. In the new chapter on insulin no reference is given to any recent work or papers; and although Prof. MacLean in several places notes his disagreement with certain opinions which have been expressed, he omits to give either the name of the authors or the references to their papers.

The book will continue to be much read and appreciated by the practitioner, for it describes the physiology and pathology of diabetes in simple language and gives a good account of insulin therapy.

[1] John Bale, Sons and Danielsson, Ltd., London. 2*s*. 6*d*.
[2] THE LANCET, 1913, ii., 1136.

X RAYS AND CRYSTAL STRUCTURE.

Fourth edition, revised and enlarged. By Sir W. H. BRAGG, K.B.E., M.A., D.Sc., F.R.S., Director of the Royal Institution of Great Britain and of the Davy Faraday Laboratory, Honorary Fellow of Trinity College, Cambridge; and W. L. BRAGG, F.R.S., Langworthy Professor of Physics in the University of Manchester. London: G. Bell and Sons, Ltd. 1924. Pp. 322. 21*s*.

THE authors have found it necessary to rewrite a great part of their original book on this subject. Since the discovery by Laue in 1912, that the regularity of structure of crystals could do for X rays what a diffraction grating does for light, a new branch of physics has developed. This allows us not only to determine the wave-lengths of beams of X rays, but, by means of the knowledge which has been gained on X ray wave-lengths, the view is encouraged that many of the details of crystal structure will be revealed by an analysis of the X ray spectra which the crystals produce. The authors have contributed largely to the advances in this subject and the X ray spectroscope of their design is now found in many laboratories. The general arrangement of the book is unaltered, but the subject-matter has grown apace; perhaps the most interesting development is the experimental attempt to reveal the structure of organic crystals by means of X ray analysis; among the organic substances so far investigated on these lines may be mentioned naphthalene, anthracene, benzoic acid, resorcinol, urea, and tartaric acid. The book finishes with an appendix of 15 pages, giving a list of all the crystal substances which have been submitted to X ray analysis.

It is attractively written and well illustrated with photographs of original line drawings, which help the reader considerably in visualising crystal structure.

ENDOCRINOLOGY.

The Endocrine Organs. An Introduction to the Study of Internal Secretion. Part I.: The Thyroid, Parathyroids, and the Suprarenal Capsules. Second edition. By Sir E. SHARPEY SCHAFER, M.D., F.R.S., Professor of Physiology in Edinburgh University. London: Longmans Green and Co. 1924. Pp. 175. 15*s*.

THE first edition of this book has been out of print now for about four years, and we extend a very hearty welcome to this the second edition. It is to appear in two volumes, of which this is the first. There is no doubt that it is one of the best books on the subject in the English or in any language. Certainly in no other work is the vast literature treated with such a masterly skill; the best of the literature has been collected and given in footnote references, and the labour this has involved must have been immense. Moreover, the literature has been brought well up to date. Sir Edward Sharpey Schafer has rendered to physiology and to medical science in general a very great service in putting the salient facts of this important branch of knowledge within easy reach of anyone who really wants to know what are the ascertained facts on internal secretion. While the matter has been considerably extended and many additions made to the illustrations, the general technical excellence of the publication is well up to that of the first edition.

An Introduction to the Study of Secretion. By SWALE VINCENT, M.D., F.R.S. Edin., Professor of Physiology, University of London (Middlesex Hospital Medical School). London: Edward Arnold and Co. 1924. Pp. 168. 10*s*. 6*d*.

THIS volume represents in slightly expanded form the matter of eight university lectures given at the Middlesex Hospital during last winter. It might well have received the sub-title "Essays of a Sceptical Physiologist," for its author clearly shows that scepticism is much preferable to improperly founded

hypothesis. One of the main objects of the book was "to examine the main facts of secretion and 'internal secretion' to see how far they may legitimately be included in a common category." The results, so far as they are sufficiently definite in the present state of our knowledge, indicate that the two functions are essentially different. We agree with the author's conclusions, and would be glad to see the book widely read, not only by physiologists but also by senior students and by those interested in organotherapy. On the last-named subject the author is very sceptical, the position of course being reached that while he prefers fact to hypothesis, he has to decide what and where a hypothesis is tenable. Individual opinion cannot here be final.

Lectures on Endocrinology. By WALTER TIMME, M.D., Attending Neurologist, Neurological Institute, New York; Professor of Endocrinology, Broad Street Hospital, New York. New York: Paul B. Hoeber, Inc. 1924. Pp. 123. $1.50. (A Reprint of an article which appeared in the *Neurological Bulletin*, January, 1921.)

THIS is a little book which takes conclusions regarding endocrinology as far as is really safe in the present condition of knowledge. Many interesting cases are described and illustrated with photographs. On the purely scientific side there is less to be said in favour of the book, for, as in many works on this subject, unjustifiable arguments are used to fill the gaps in our knowledge. But as the work is intended mainly for clinical readers there can be little objection to it on those grounds.

MARRIAGE AND SYPHILIS.

By G. M. KATSAINOS. Boston: Wright and Potter. 1923. Pp. 162.

THE campaign for the eradication of venereal disease was won the day that "syphilis" appeared in the headlines of a respectable newspaper, but the victory needs to be pushed home in every possible way. Dr. Katsainos proceeds along the blood-curdling line, and by his descriptions and pictures of the most extreme results of congenital syphilis will impress some, but he will offend the moderate by his exaggeration, medical men by his accusations of indifference and carelessness, women by his frank conclusion that they are unfit for the medical profession because they do not understand syphilis. They will perhaps forgive him for his real sincerity in the best of causes.

PAPERS ON PSYCHO-ANALYSIS.

Third edition. By ERNEST JONES, M.D., M.R.C.P. Lond., President of the International Psycho-Analytical Association and of the British Psycho-Analytical Society. London: Baillière, Tindall and Cox. 1923. Pp. 731. 25*s*.

THESE are chiefly papers read before various societies, and, though not arranged in chronological order, indicate the growth of the complexity of the subject. The order gives an impression of unevenness; the fourth chapter plunges the reader into an account of recent advances in psycho-analysis for which he is scarcely prepared, and the chapter answering criticisms of psycho-analysis would be better placed early in the book. Five chapters are new and replace an equal number now omitted. That on the nature of auto-suggestion has been called forth by the need for examining this current explanation of mental phenomena, and the author, like everyone who attempts a serious examination of suggestion, finds definition difficult. One gathers that he recognises both auto- and hetero-suggestion: the former depends upon a primary narcissism, aided by the primitive belief in the omnipotence of thought, whilst if the ego-ideal is resolved into the earlier father-ideal—that is, if the subject reverts to an infantile attitude towards the suggestor—the process may be termed hetero-suggestion. He regards it as impossible to combine suggestion with psycho-analysis. Of the older chapters one, dated 1909, describes a case of wandering associated with loss of memory, and it is to be noted that, although such cases seem to be frequent, the fact that the patients are amenable to treatment directed to the restoration of the lost memories is not yet part of our common knowledge.

The new-comer to the subject will find some papers easy and others almost beyond his grasp, but the appearance of a third edition shows that the book is able to compete successfully with less authoritative works which would present us with a "psycho-analysis without tears."

MIND AS A FORCE.

By CHARLES F. HARFORD, M.A., M.D. London: George Allen and Unwin. 1923. Pp. 128. 3*s*. 6*d*.

Dr. Harford makes no pretence to represent any but his own views, though his chief theme is the method of treatment associated with the name of Mr. Coué. He is somewhat naive in making apparently simple postulates which lead to sad complications. Mind is a force, he says on page 17, and a few pages later we read of a new memory being added to the "store chambers of the mind." This puzzle, like the identification of conscience with the Freudian "censor," should set psychologists thinking. The claim that micro-organisms, chemical poisons, and the like must operate through some influence of the mind is likewise stimulating. His explanation of the "law of reversed effort," however, emphasises a phenomenon often overlooked by those who regard the neurotic sufferer as a person who only needs to exercise "will" in order to get well. He has expressed a clinical fact, too often ignored, in the following words: "To attempt to counteract the evil tendency of the strong emotional force in the memory by a counter-charge of emotional force exercised by the will leads to a deadlock or reverse." The author is evidently a religious man with a charming tolerance and a persuasive manner of writing. One pictures him as easily attaining a personal influence over his patients which, in spite of his own theories, is probably more effective than any auto-suggestion. The book is, as indicated above, not a sound guide to theory, but it carries a suggestion of restfulness often lacking in psychological literature, and, whether written for the purpose or not, could be safely, and perhaps with benefit, placed in the hands of many neurotic patients.

JOURNALS.

QUARTERLY JOURNAL OF MICROSCOPICAL SCIENCE. Edited by Prof. GOODRICH, F.R.S., and others. Vol. LXVII., Parts 3 and 4. Oxford University Press.—These two parts deal with a variety of zoological topics representing nearly the whole range of the practical aspects of the science. There are 11 separate memoirs, all of interest. Dr. Woodland has continued former studies upon the structure of the monozoan cestodes, a group probably serving to connect the older cestodes with the corresponding group of trematodes, which latter is entirely "monozoan" and never forms indefinitely multiplying chains lying in contact like the familiar forms of cestodes. Another paper, dealing also with the general anatomy of a species, is that by Dr. Agersborg, of Williams College, Massachusetts, upon the Nudibranch *Melibe leonina*. It is a comprehensive memoir illustrated by 11 double plates and containing a full bibliography. Among the lower forms of life the fairly well known infusorian, originally described by Ehrenberg, and named *Spirostomum ambiguum*, is dealt with by Miss Bishop, who has specially studied the meganucleus and micronuclei which are abundantly figured in two plates. Other protozoa form the subject of papers by Prof. Bronte Gatenby and Miss King (The Golgi Bodies of a Coccidian), while Mr. J. S. Huxley and Mr. de Beer write upon "Dedifferentiation" in Campanularia and Obelia by resorption of the hydranths wholly or mainly into the stem.

The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

XII.—PUBLIC HEALTH APPOINTMENTS.

BY G. S. ELLISTON, *M.C.*, M.A.,
BARRISTER-AT-LAW; EXECUTIVE SECRETARY, SOCIETY OF MEDICAL OFFICERS OF HEALTH.[1]

"I am as poor as Job, my Lord, but not so patient."—*Henry IV.*, Pt. II., Act 1.

A CERTAIN liveliness which has been noticeable in connexion with public health appointments during the last five years is perhaps not wholly understood by private practitioners or by young graduates who are considering the pursuit of preventive medicine as a career. It may be useful, therefore, if we consider here the conditions at present obtaining in the public health service and the policy of the British Medical Association and the Society of Medical Officers of Health in regard thereto.

Evolution of the Public Health Service.

For some reason which is difficult to explain the remuneration of public health appointments has never yet borne any reasonable relation to the earnings of practitioners in other branches of medicine. In spite of this fact many good men were attracted to a service which offers unique opportunities of advancing the well-being of the community. The work accomplished by these pioneers during the last half-century met with scant recognition, although the results they achieved brought about a spectacular reduction in morbidity and mortality. Of recent years there has been legislation involving a remarkable extension in the provision of public health medical services, and the men who had been mainly concerned with environmental hygiene, found themselves responsible for the medical supervision of school-children, the welfare of mothers and infants, the organisation of clinics for the treatment of defects and minor ailments, and the administration of schemes for the control and treatment of tuberculosis and venereal diseases. It was when they realised how closely the public health department must be brought into contact with the private practitioner that medical officers of health became uneasy about the staffing of the service. While they had been content to accept almost contemptuous salaries themselves, it dawned upon them that for the extended activities of their departments they must have assistant colleagues of good standing who would command the confidence of the public and the respect of the private practitioner. It meant, in fact, that in order to attract and retain such assistants, the service must offer salaries comparable with the rewards of other branches of practice. Thus it happened that a campaign for fair salaries in the public health service has been initiated and carried through mainly by senior medical officers of health who can expect no personal gain from the result of their efforts.

Staffing of Health Departments.

The majority of the medical officers[2] who have chosen the public health service as a career are real enthusiasts, and if they magnify their office it is because they fervently believe that the future belongs to preventive medicine. But they know well enough that the influence of the health department cannot reach its maximum until every private practitioner is coöperating for the prevention of disease. Hence their anxiety to attract promising young graduates to the public health service, men with qualifications and experience that will secure the confidence of their colleagues in private practice. They would like it to be recognised by the medical schools that the extension of preventive medicine calls for the best brains of the profession, more especially as the health officials in their relation to local authorities can do much to instruct lay opinion on medical matters. It is not enough, however, to offer a young doctor work of extraordinary interest and influence; if he is to accept the limitations of an official post he is surely entitled to an adequate salary with reasonable prospects of advancement. Otherwise the public health service must be staffed by men with private means, by men with no ambition, or by men who have failed in other branches of practice.

Before the great extension of health services there were so few assistant medical officers of health that all of them might expect to secure promotion to a principal post in the course of time. To-day things are very different, for in the counties and big cities, in addition to deputy or assistant medical officers of health for general administrative purposes, there are assistant medical officers for specialist branches dealing with tuberculosis, maternity and child welfare, school-children, bacteriology, or venereal diseases, and clinical medical officers for ear, eye, nose, throat, and skin defects and minor ailments. Obviously, only a small percentage of these assistant medical officers can become medical officers of health, and a principal consideration with the Society of Medical Officers of Health has been to devise a graded list of appointments that would encourage experienced men to remain in the service. It should be recognised, therefore, that we have now in the public health service two types of assistant, although in the smaller areas one medical man may combine the duties of both. But it seems likely that the types will become more and more distinct as the organisation of the public health service develops, so we may consider here the training and experience which should be expected of candidates for these posts.

Assistantships in the Service.

Administrative Posts.—The young medical graduate whose ultimate ambition is to become a medical officer of health, has several years' work ahead of him before he should seek his first appointment. Under the new regulations of the General Medical Council it will take him two years to acquire his D.P.H. or other specialist qualification in State medicine. For a further period he should hold resident appointments in hospitals for women and children, and for the treatment of ear, eye, nose, throat, and skin affections. All this in order that later on he may be competent to administer the various health schemes of his local authority. It is also advisable that he should serve for six months or so as assistant to a busy general practitioner, so that he may realise the difficulties to be contended with in that field. The head master of Westminster School lately urged[3] that there should be no hurry or impatience in the education of the young doctor, whose training must necessarily be more prolonged than in the case of other learned professions. The head master indicated 27 years as the age when the public began to feel confidence in a private practitioner, and it is about that time the average graduate is ready for his first appointment in the public health service. Even then he should extend his experience by entering as a resident medical officer at a municipal fever hospital or tuberculosis sanatorium. It will be seen, therefore, that the medical man who wishes to equip himself thoroughly for the highest administrative posts in the public health service will not have completed his full training much before his thirtieth year.

Specialist Posts.—Although a public health qualification is not essential for those entering specialist branches of the service it is very desirable, for even

[1] Although an official of the Society of Medical Officers of Health, the writer of this article accepts sole responsibility for the statements set out here, which represent his own interpretation of the considerations which brought about the movement for a scale of salaries for the public health service.

[2] Throughout the article all references to medical officers apply equally to men and women practitioners, it being understood that there should be equal remuneration for both sexes.

[3] Brit. Med. Jour., March 8th, 1924, p. 438.

the clinical activities of the health department should be based on the general scheme for the prevention of disease. Beyond this point he will follow the usual course of training for his particular branch of work by residence and attendance at the appropriate special hospitals. If he is wise, and if he hopes to attain a senior post in the public health service, he will take one of the higher qualifications in medicine or surgery, for the value of the specialist medical officer depends very much on the confidence he inspires amongst the private practitioners in his area. Hitherto these posts have been so badly paid that the claims of the men appointed to be regarded as specialists have sometimes been very slender, so that the experienced general practitioner has felt no great respect for suggestions coming from the public health department. It was in order to attract highly qualified men for these clinical posts that the Society of Medical Officers of Health decided it was necessary to grade these appointments and to offer them reasonable prospects of advancement on the lines indicated below.

Minimum Commencing Salaries.

We thus arrive at the necessity for a minimum commencing salary for medical men entering the public health service. The Society of Medical Officers of Health contend that highly-trained men are required for these posts and that the right type of candidate will be nearly 30 years of age before he is ready for his first appointment. The Society therefore recommended that the minimum commencing salary should be £600 per annum, on the understanding that entrants must have had three years' professional experience subsequent to obtaining their registrable qualification. This recommendation was approved and adopted by the annual representative meeting of the British Medical Association at Portsmouth last July, and advertisements offering less remuneration for assistant posts are no longer accepted by the professional journals. It is satisfactory to note that local authorities are realising that this minimum is a reasonable one, and over 20 assistant medical officers have been appointed at £600 since September last. In a number of cases the minimum has been resisted and, unfortunately, there have been applicants who were willing to accept the posts. On several occasions, however, the appointing authorities have not been satisfied with the restricted selection open to them on such terms, and the vacancy has been readvertised offering the recognised salary. Even when candidates are willing to seize an easy opportunity of securing a post, it is recognised by local authorities that their health departments lose prestige when appointments are not approved by the representative bodies of the profession.

Promotions and Increments.

It must be understood that the £600 minimum applies only to a junior assistant working under the medical officer of health, or under a senior medical officer. The latter category includes those medical officers who are in charge of departments (e.g., schools, tuberculosis, venereal diseases, maternity and child welfare, mental deficiency) and who are directly responsible to the medical officer of health, or, more rarely, as in the case of some school medical officers, to a committee. The minimum commencing salary for these senior medical officers is fixed at £750 when single-handed, rising to £1100 for those with six assistants, with increments of £50 for each additional two assistants. In the case of a deputy medical officer of health duly appointed to assist his chief in the general administration of the health department, the minimum commencing salary must be equal to 60 per cent. of the salary of the medical officer of health and not less than the salary of the next grade of medical officer in the department. Finally, we have the scale for medical officers of health commencing with a minimum of £800 in areas where the population is less than 35,000, and ascending by graded increases to £1800 for populations exceeding 600,000. The scale thus briefly summarised has been widely circulated by the British Medical Association with recommendations that the salaries indicated should be augmented by annual increments of 5 per cent., rising to 40 per cent. above the minimum basic rates, as an encouragement to experienced men to remain in the service. It is also understood that the above scale is not subject to reduction when the civil service bonus at present granted in many areas is reduced or withdrawn, such bonus being a definite addition to meet temporary economic conditions. An important principle embodied in the scale by the British Medical Association is that all public health salaries must be net, any expenses necessitated by the duties being paid by the local authority.

Enforcement of an Equitable Scale.

Those who are chiefly concerned believe that the adoption of this scale by the British Medical Association will have a marked effect on the enterprise and efficiency of the public health service. They believe also that the continuance of low salaries represented a real menace to the interests of the whole profession. This became obvious quite recently when the Ministry of Health, seeking to justify a reduction of the capitation fee for insurance practitioners, informed the Court of Inquiry that "for public health appointments men of superior qualifications, and in the case of medical officer of health appointments, men approaching middle age, can be secured for salaries in the neighbourhood of £800." In support of that statement the Ministry published a table showing that 97 principal posts had been filled in the three years 1920, 1921, 1922 by men aged about 39 at salaries less than £800 per annum.

The scale as now adopted is the result of nearly five years' work by a committee of the Society of Medical Officers of Health in frequent conference with representatives of the British Medical Association. It has received the sanction of the annual parliament of the profession, and it is being enforced with the invaluable and indispensable assistance of the professional journals. It was submitted for the information of the associations representative of county, borough, and district councils, who were invited to indicate any modifications which would make the scale more easily workable. It is much to be hoped that negotiations with these bodies will ultimately result in an agreement that will avoid disputes in reference to the terms of future appointments.

Meanwhile, it is the bounden duty of every medical man to support his colleagues in their efforts to place the remuneration of the public health service on a fair basis. It is not only the new entrants who are affected, but those already in office will benefit when the inadequacy of existing salaries becomes conspicuous in comparison with the pay of junior appointments. For quite obviously the enforcement of the new scale will be followed almost automatically by an adjustment in the payment of the whole public health service. Only one precaution is necessary for those who are not familiar with the scale,[4] they should apply for no public health appointment which is advertised only in the lay newspapers until they have inquired of the British Medical Association or the Society of Medical Officers of Health whether the terms are approved by those bodies. With loyal coöperation of this kind the attempts by local authorities to obtain cheap medical services will soon be abandoned.

[4] The scale was set out in THE LANCET, July 28th, 1923, p. 187.

MEMORIAL TO THE LATE DR. G. S. HART.—To memory of the late Dr. Hart, of Measham, a Dodge Motor Ambulance was dedicated on March 12th in the Market Square of that town in the presence of a large gathering of his former patients and friends. After the service Dr. R. Logan, of Ashby-de-la-Zouch, gave a memorial address and spoke in feeling terms of his late friend and colleague. The cost of the ambulance had been subscribed largely in the district, and former colleagues of the late Dr. Hart in Ulster had also contributed generously. Dr. Hart died in September of last year, and his death had been a great loss to the district.

MEMORIAL TO LORD LISTER.

THE memorial to Lord Lister, in bronze and granite, designed by the late Sir Thomas Brock and erected in Portland-place, London, W., was unveiled on March 13th by Sir John Bland-Sutton, President of the Royal College of Surgeons of England, in the absence, through illness, of Sir Charles Sherrington, President of the Royal Society.

Lord Hambleden, Deputy Chairman of the Executive Committee of the Lister Memorial Fund, opened the ceremony by outlining the history of the Fund. He said that very soon after Lord Lister's death in 1913 a committee was formed at the instance of the Royal Society and of the Royal College of Surgeons, with the object of commemorating the services of Lord Lister to science and to the alleviation of human suffering. That committee suggested that there should be in the first place a tablet, with a medallion and inscription, in Westminster Abbey; in the second place, a monument in London; and thirdly, the establishment of an international Lister Memorial Fund for the advancement of surgery, from which grants could be made for research and for distinguished contributions in surgical science, irrespective of nationality. A meeting was held at the Mansion House, and subsequently an appeal was circulated which met with response from all quarters of the world. Altogether, including interest, a sum of nearly £12,000 had been made available. The tablet had been placed in the Abbey for some time; and £5000 had been given to the Memorial Fund, which was in the care of the Royal College of Surgeons; and, finally, they had the statue. They were greatly indebted,

FIG. 1.

The Island Site in Portland-place, London.

he said, to Sir John Rose Bradford, hon. secretary, and Mr. F. A. Towle, assist. hon. secretary, for the very efficient administration of the business of the Fund.

Sir John Bland-Sutton then unveiled the statue and spoke as follows: "This memorial has been raised to the memory of a great surgeon, Lord Lister, who by his discoveries in science and his devotion to surgery united surgery and science, raised the art he practised, and launched it on the most wonderful era in its history. It is an honour to unveil this monument as a memorial of a genius who did so much to unveil the secrets of nature and taught surgeons safe methods for relieving men, women, and children from the dread consequences of septic infection. Veterinary surgeons apply the same principles when performing operations for the relief of physical suffering on horses, cattle, cats, and dogs. Lord Lister had the rare advantage of seeing his principles adopted by surgeons throughout the world. His influence will remain as long as surgery is practised as an art, and the principles he discovered will remain as a blessing on every race of mankind. He was inflexible in the pursuit of truth and may be described as patience personified."

FIG. 2.

The bust of Lister surmounting the memorial.

Lord Hambleden asked the Mayor of St. Marylebone to take the statue under the care of the borough council, which duty the Mayor accepted, on behalf of the present and future councils.

Among those present were:—

Sir Rickman and Lady Godlee, Sir William Lister, the Misses Lister, and other members of Lord Lister's family; Viscount Hambleden, the Mayor and Mayoress of St. Marylebone, Sir John Rose Bradford and Lady Bradford, Sir Frederick M. Fry. The Royal Society was represented by Lieut.-Colonel Sir David Prain, Mr. W. B. Hardy, and Mr. J. H. Jeans, Sir Arthur Schuster, Sir David Ferrier, Sir Frederick Mott, and Sir Arthur Keith; The Royal College of Physicians of London by Sir Humphry Rolleston; the Royal College of Surgeons of England by Sir John Bland-Sutton and several members of Council; the Royal College of Surgeons in Ireland by Sir William de C. Wheeler; the Royal Society of Medicine by Sir William Hale-White; the Medical Society of London by Dr. H. R. Spencer; the Lister Institute by Prof. C. J. Martin; the University of London by Mr. H. J. Waring; the University of Glasgow and the Royal Society of Edinburgh by Prof. F. O. Bower; the Glasgow Lister Memorial Committee by Lord Blythswood, Sir John S. Samuel, Prof. R. Kennedy, and Prof. Magnus Maclean. There were also present: Sir Charles Ballance, Sir D'Arcy Power, Sir Cuthbert Wallace, Sir Alfred Fripp, Sir Anderson Critchett, Sir G. L. Cheatle, Sir George Makins, and Mr. Henry Jones, a faithful servant of Lord Lister for 40 years.

WHIPPS CROSS HOSPITAL, LEYTONSTONE.—A reception on the occasion of the twenty-first anniversary of the opening of this institution will be held at the hospital on March 26th, when a conference, followed by a discussion, on Medical, Nursing, and Hospital Progress will take place. Dr. J. C. Muir and Mr. Thomas Smith, clerk to the guardians, will read papers.

THE LANCET.

LONDON: SATURDAY, MARCH 22, 1924.

ON INQUESTS AND AUTOPSIES.

MEDICINE as well as justice requires the accurate determination of the cause of death in all cases brought to the notice of the coroner. But in many parts of the country the lack of any provision for storing bodies is a real stumbling-block to this determination. The unsuitability for its purpose of the existing mortuary at Ipswich was brought to the notice of Parliament a few days ago by the representative of the borough, when the Under-Secretary of State for the Home Department was asked whether his attention had been drawn to the coroner's statement that he had been compelled to ask the proprietor of an hotel to allow a body to remain in the hotel until after an inquest on account of the unsatisfactory mortuary accommodation. Dr. A. H. BYGOTT, medical officer of health for West Suffolk, who recently brought the subject before the Royal Institute of Public Health, writes of the conditions under which post-mortem examinations are made in rural areas as being frequently disgusting. Twelve thousand post-mortem examinations are made annually by order of coroners, without affording proper means of instruction to medical students or for the collection of pathological knowledge. Dr. BYGOTT regards the viewing of the body by jurors as unnecessary; were this dispensed with, the body could be moved to a pathological department at some large centre, where pathological, chemical, and bacteriological investigations could be made. We agree that viewing the body is a small matter which might be abolished without harm, especially as many men and women see death for the first time when acting as jurors. The provision of mortuaries, however, at present rests with the local authorities, upon whom it is difficult to bring compulsion, for the Home Department has stated that it has no authority in the matter.

The Public Health Act, 1875, Section 141, states that the local authority may, or if required by the Minister of Health must, provide a mortuary, and Section 143 states that the authority may provide a post-mortem room, although there is no compulsion. Under the provisions of the Public Health (London) Act, 1891, every sanitary authority shall provide and fit up mortuaries, and if ordered by the county council must provide a most-mortem room, but no details are given for the staffing or provision of apparatus. Perhaps the question should have been addressed to the Minister of Health rather than to the Home Secretary. The condition of London mortuaries is good on the whole, although a year or two ago the post-mortem room attached to a mortuary (not associated with a hospital) was lighted only by fish-tail burners, and the only hot water available was from kettles. In country districts, where provision of mortuaries could not lightly be undertaken, the arrangements are often primitive; the pathologist may have to be content with the kitchen of an empty cottage near by. Doubtless the frequent reluctance on the part of coroners and doctors to holding post-mortem examinations is often due to this lack of accommodation. Regarding equipment, the London mortuaries are on the whole good, but in some respects are lacking. It often happens that there are no proper jars available if viscera are to be reserved for examination, and analysts frequently receive consignments in old jam jars or tins, tied up with newspaper and string, and unlabelled. It is doubtful if any of the mortuaries have apparatus for the preservation of material for bacteriological examination.

When it is considered necessary to hold an inquest it is equally necessary to hold a post-mortem examination in most cases, if the inquiry is to be satisfactory. And yet out of 5551 inquests collected from various parts of England, Dr. BYGOTT found only 2608 post-mortem examinations. Analytical and possibly bacteriological investigation may be desirable. A coroner has been known to decide against a post-mortem examination, although the issue was a choice between murder, manslaughter or suicide; such a decision may render exhumation necessary, and reopening of the whole proceedings. Directly or indirectly pressure is brought to bear on coroners to limit examinations with a view to saving expense, and also on doctors by relatives for this and other reasons. The provision of expert pathologists, analysts and bacteriologists is to be commended—if investigations were more thorough many more crimes would come to light—but there is little financial inducement to take up this class of work, and little encouragement to perform it thoroughly, when the law as it stands insists on experts being present at every adjourned inquest. In some cases the fee offered to the pathologist hardly covers expenses. The suggestion has been made to remove bodies to hospitals, at any rate in country places, so that a full investigation may be made. But as far as teaching hospitals are concerned, they already have sufficient material to keep their regular staff busy; the larger non-teaching hospitals may have a pathologist but no analyst, so that materials would still have to be sent to the public analyst. Only in exceptional cases does the Home Office intervene. Whether hospital pathologists would welcome continuous attendance at the courts on the present rates of remuneration is hardly doubtful; in country cases there would be the extra expense of transporting the body, and a longer call on the pathologist's time. With the suggestion that the functions of the coroner should be transferred to the medical officer of health we are not in agreement. The health officer has duties which bring him into contact with his fellow citizens in a variety of ways. For a semi-judicial inquiry of this type, it seems pre-eminently desirable to choose an independent person having no relation with municipal or other public duties, and not under the direction of a local council. We should like to see more whole-time coroners serving wider areas. That the coroner should be a medical man has always been advocated in our columns. If he is also a barrister so much the better, but if not any legal errors which he may commit, such as the transgression of the laws of evidence, are less important than medical errors, for legal errors can always be rectified in another court. Legal authorities have always opposed the holding of inquiries in camera, but in certain cases it might be desirable to admit only those persons who could give good reason for desiring admission, to the exclusion of the idly curious.

ADOPTION OF CHILDREN.

OVER 40 years ago New Zealand legislated for the adoption of children. Unlike the laws of ancient Rome, which mainly studied the provision of heirs for childless parents, the legislation of modern communities on this subject is chiefly concerned with the welfare of the child. New Zealand had realised that foster-parents can give the same care and affection to an adopted son or daughter as the natural parents themselves, and that, where this is the case, it may be advisable to give legal security to the relationship between foster parent and adopted child. Otherwise when a child has been removed from the control of unworthy and disreputable parents and placed with persons who give it proper care and often spend considerable sums upon its education, the original parents can disturb its well-being and its prospects by reclaiming it from the family in which it may be happily settled. Readers of Mr. KIPLING'S story "Friendly Brook" may consider his picture of the disreputable father blackmailing the family into which his child has been adopted to be uncomfortably close to the truth. Other countries have passed adoption laws similar to those of New Zealand. Possibly the war stimulated such legislation. Italy, at any rate, made special provision in 1919 for the adoption of war orphans. Since that year, within the Empire, British Columbia, Ontario, Saskatchewan, and Tasmania have passed Acts giving legal recognition to adoption. And now the Mother of Parliaments has before her at the present moment three Bills all dealing with the adoption of children and all emphasising the principle that adoption is not to be sanctioned unless it is likely to promote the welfare of the child.

Of these three Bills, Sir THOMAS INSKIP'S is the shortest, and therefore, in present Parliamentary conditions, the most hopeful. He would simply enact that parents or guardians may transfer their authorities and duties in respect of a child, subject to the approval of a county court or High Court judge. The Bill closely follows that of Mr. NICHOLSON which obtained a second reading in 1922, and that of Sir LEONARD BRASSEY presented in 1923, except that the adopter is no longer described by a harsh legal label as "transferee" of the child, and that the age-limit for adoptable children is raised from 7 to 10 years. The proposal contains the minimum. The other two Bills, one promoted by Sir M. MACNAGHTEN, the other by the DUKE OF ATHOLL, go into greater detail, much of which is common to both. They specify various conditions of adoption and various persons whose consent must be obtained. They do not restrict adoption to children under 10, but stipulate that if the child is over 12 its consent is necessary. They insist that the adopter must be at least 20 years older than the child adopted, and they prohibit marriage between the two. They allow the court to adjourn an application for adoption while permitting the child to be placed meanwhile with the proposed adopter, thus sanctioning a kind of temporary adoption on approval. Finally, while providing for registration, they make the records confidential. The DUKE OF ATHOLL'S Bill has special features. It has had a second reading in the House of Lords, and must be distinguished from the unpublished Scottish Bill introduced by the DUCHESS OF ATHOLL in the House of Commons. As befits a House of Lords measure, it proposes that adoption shall not affect the succession to any dignity or title of honour. It brings the adoptive relationship within the prohibited degrees already recognised by our marriage laws, and it extends the law of incest to adopted children—no doubt in recollection of a New Zealand case where an offender raised the defence that the child in question was an adopted child. The DUKE OF ATHOLL'S Bill confines itself to county court machinery and makes the county court judge's decision for most purposes final. It speaks throughout of "the child," and yet it contemplates the adoption of persons up to 21 years of age provided that they have no husband or wife living. The Macnaghten Bill, which is virtually identical with one presented by Mr. HURST in 1923, allows the abrogation of adoption for any good cause at the instance of the adopter, or the child (if over 16), or any relative or other person interested in the welfare of the child. If the court sanctions the abrogation, the parties are put back in their original positions as though no adoption had ever been made; if it is the adopter who wants the relationship ended, the court may insist on provision for the child.

The elaboration of detail increases the difficulty of draftsmanship. Sir M. MACNAGHTEN says a proposed adopter must be "of good repute," a happier expression than the original New Zealand stipulation that he should be "respectable." The DUKE OF ATHOLL in ampler phrasing would require him to be "a fit and proper person, having regard to all the circumstances, to have the care and custody of the child," and to be in a position and to intend to provide "suitable and proper maintenance and education as though it were his own child." If our county court judges are to be called upon to make the proposals work, they will appreciate the implied compliment to their abilities while conscious of the great addition to their already heavy duties. Competent observers of the working of the Adoption of Children Act in New Zealand, where the original provisions of 1881 were simplified in 1895 and have since been further amended in the light of experience, claim that it is a success from every point of view. It has been estimated that in a large proportion of cases the adoption orders relate to illegitimate children. The child benefits by obtaining a continuous home life, an environment equal to that of an ordinary legitimate child, and a proper chance of becoming a useful citizen. The adopting parents, perhaps childless, obtain a son or daughter whom they can regard and care for as their own. The State is relieved of the possible burden of maintaining the child. New Zealand makes provision for rescinding adoption orders in unsatisfactory cases, but it is stated that the percentage of these is very small. The social conditions and the legislative requirements of great pioneer communities overseas are not always identical with those of the home country; but England cannot afford to dispense with any measure which will better the welfare and the chances of children who will otherwise be neglected and handicapped unfairly in their upbringing. The association of illegitimacy with many deplorable and intractable conditions which come under medical notice, should ensure for a proper method of adoption the support of our profession.

THE EFFECT OF MATERNAL SYPHILIS ON THE DEATH OF THE CHILD.

AN investigation[1] of 1000 women of the hospital class in Glasgow has recently been undertaken just before, at, or immediately after labour, with the object of determining the incidence of syphilis in such women, of congenital syphilis in their children, and the effects of syphilis on the frequency of abortion,

[1] Child Life Investigation. Maternal Syphilis as a Cause of Death of Fœtus of the New-born Child. By John Norman Cruickshank, M.D., F.R.F.P. and S. Medical Research Council. Special Reports, No. 82. 1924. H.M. Stationery Office. 1s. 6d.

premature birth, and stillbirth. The work has been carried out for the Medical Research Council by Dr. J. N. CRUICKSHANK, and has evidently been painstaking and thorough. In the series of 1000 cases 9–10 per cent. gave a positive Wassermann reaction, and as a certain small number of cases admittedly fail to give a positive reaction in pregnancy, any slight error is doubtless in favour of the patients. This percentage corresponds with that of most recent observers in this field. Dr. CRUICKSHANK found that in practically every case (94 per cent.) the W.R. of the mother was in agreement with the reaction of the child at birth. He queries, however, the interpretation of a positive W.R. in the case of the new-born child: Is it the reaction of the child's blood—may it not be due to transference of the mother's reacting substances to the fœtal circulation? An investigation, carried out by Dr. H. C. BRUNNER[2] at a maternity hospital in Lausanne, brings out the fact that the Wassermann reaction is not very reliable in the diagnosis of congenital syphilis in the new-born. Among 150 new-born infants whose blood, taken from the umbilical cord at birth, was examined by the Wassermann test, there were only two giving a positive reaction, although at least six of the mothers were definitely syphilitic and Wassermann-positive. Curiously enough, in the only case in which the mother had contracted syphilis late in the course of her pregnancy, the new-born infant, as well as the mother, was found to be Wassermann-positive. A comparison of the Wassermann reactions in the mother and child in 113 cases of maternal syphilis of recent or old standing showed that it was positive in both mother and child in 50 cases, positive in the mother and negative in the infant in 35 cases, and negative in both mother and infant in 28 cases. There was not a single case in Dr. BRUNNER'S series in which this reaction was negative in the mother and positive in her infant.

As regards incidence of abortion, which Dr. CRUICKSHANK interprets as "birth of child before it was viable"—his figures prove no greater percentage of abortions in the group with positive W.R. over the group with negative results. Stillbirths were proved to be more frequent in syphilitic cases—18·07 per cent. as against 15·15 per cent. of non-syphilitic cases; and as he further demonstrates that a considerable proportion of the latter were sent into hospital with obstetric complications, almost inevitably causing death of the child, the figures could easily be made more striking if normal deliveries in syphilitic and non-syphilitic cases were compared. The incidence of premature births (after seven months) was vastly greater also in the syphilitic cases—32·5 per cent. of syphilitic cases as against 19·8 per cent. of non-infected women, and in this group of infected cases 38·7 per cent. had stillborn as well as premature babies. No relationship was proved to exist between ante-partum and post-partum hæmorrhage and syphilis, nor was syphilis found to be at all an important factor in the ætiology of eclampsia. In the cases which could be followed up for some months after delivery, a definitely larger percentage of infants with a positive W.R. died, compared with those non-infected. While not providing any strikingly new data on the subject, this independent and patient study of 1000 cases is well worth recording as confirmation of previous knowledge in a field not yet fully explored.

[2] Schweiz. med. Woch., Jan. 24th, 1924.

Annotations.

"Ne quid nimis."

TREATMENTS IN VOGUE IN GERMAN SANATORIUMS.

THE pooling of German sanatorium reports and their editing by Dr. H. Ulrici every year in *Beiträge zur Klinik der Tuberkulose* enable readers to ascertain in a few minutes what are the most popular therapeutic measures in German sanatoriums. Dr. Ulrici's latest review[1] covers the year 1922, and deals with the reports of 40 hospitals for diseases of the lungs. Considering how varied the treatment was, it is disappointing to find that only 15 per cent. of all the cases of "open" tuberculosis became sputum-negative during treatment. Perhaps one of the most important excuses for these meagre results is to be found in the shortness of the average duration of treatment; in as great a proportion as 84 per cent. of the adult male patients the duration of treatment was three months or less. Only 11 of the 40 hospitals practised artificial pneumothorax, 626 of 7068 patients suffering from "open" tuberculosis in the second and third stages being given this treatment. But whereas only 8·9 per cent. were treated by artificial pneumothorax, 26 per cent. were treated with some form of tuberculin. Ten different tuberculins or tuberculin methods were employed by these 40 institutions, and the three most popular methods, to judge by the number of patients treated, were Petruschky's, Ponndorf's and Much's (partial antigens). The least popular was Selter's "vital tuberculin," which was given in only five cases. Only 28 patients were treated with protein injections, whereas as many as 453 were given some form of chemo-therapy, the gold salt, krysolgan, heading the list with 289 cases. Sun-baths are, apparently, not yet popular in German sanatoriums, and only 1·7 per cent. of all the adult cases of pulmonary tuberculosis were given this treatment. Treatment with artificial light was much more popular, being given in 11·1 per cent. Of 2373 children, only 3·5 per cent. were given sun-baths, whereas 21 per cent. were treated with some form of artificial light. With regard to the results claimed for these various methods of treatment, even the most ingenuous and impressionable reader must be tempted to draw the conclusion that it is the nature of the disease rather than the nature of the treatment that determines the issue. Tuberkulomucin achieved good results in 56 per cent. of the first- and second-stage cases, and the same measure of success was claimed for old tuberculin, albumose-free tuberculin, and bacillary emulsion. Petruschky's tuberculin inunction was beneficial in 61 per cent., partial antigens in 65 per cent., artificial radiation in 63 per cent., and, in the case of children suffering from surgical tuberculosis, in 99 per cent. Until therapeutic claims are supported by an account of the exact nature of the disease and its activity in the patients cured, the sceptical will continue to doubt the efficacy of the *vis medicatrix hominis*.

A CLINICAL ANTHOLOGY.

INDIVIDUAL feelings as to the general value of anthologies vary. Some regard them as a superfluity; others may find in them a pleasant form of reading, which demands no great intellectual effort. Usually such compilations of other people's works are extracted from poetical or prose literature dealing with some particular aspect of life or nature. The application of this principle to medical books is a new idea which may well make an appeal to certain practitioners and students. Dr. W. F. Dutton has compiled an anthology[2] of intravenous therapy, which will be valuable for reference and will certainly appeal strongly to all those who intend to devote their lives

[1] Beiträge, 1924, lvii., 332.

[2] Intravenous Therapy. By Walton Forest Dutton, M.D. Philadelphia: F. Davis Co. 1924. Pp. 542. $5.50.

to attaining a special skill in this branch of medicine (or is it surgery?). The insertion of a syringe needle into a vein is an operation which requires much skill for its certain performance, and it will be encouraging to the intending specialist to find that so wide a field will be open to him. Several chapters are devoted to an account of the theory and practice of blood transfusion. Other subjects discussed at length are the use of arsenic compounds and intravenous anæsthesia. The second and larger part of the book deals with all the other conditions for which medicaments may be injected into a vein. These are arranged alphabetically and number no less than 108. All forms of treatment available for each condition are mentioned, as well as those that are more strictly intravenous. The book may be depended upon to give the most recent form of treatment available in each case. Thus the author emphasises the importance of the intravenous injection of caseosan for the various complications of gonorrhœa. The value of the book is enhanced by a number of excellent illustrations, some in colours, depicting the median basilic vein, the best method of constricting the upper arm with a bandage, and other points of importance. Dr. Dutton does not, as an honest anthologist, claim any originality for his book except as regards the idea. He is unable to find that any similar work has yet been published.

A DIET SCHEME FOR THE TROPICS.

THE special physiology of the white man in the tropics has recently been enlightened by two suggestive papers[1] from the pen of Dr. H. W. Kipping, of the Physiological Institute of the University of Hamburg. In these he points out that, apart from diseases, the great problem of the tropics is how to keep cool. The environment of the body cannot usually be much altered, but, within that environment, the temperature of the body is raised by work and food and lowered by sweating, which, however, gives little relief if the surrounding air is very damp as well as hot. It must be, therefore, our endeavour to avoid raising the body temperature, carelessly, without reason. White men are more liable than natives to heat-stroke, because they work harder and so raise their temperature more. Dr. Kipping gives instances of healthy European firemen whose body temperatures, when working in the fire-room during the passage of the Red Sea, rose to 101·5° F. The maximum safe output of work is, he thinks, a matter for calculation, being a function of the drying power of the air, its temperature, and its movement. But taking food also raises temperature, especially protein food; fats and carbohydrates exert less effect, and can be stored if taken in excess of immediate requirement. Proteins break up into amino-acids which, circulating in the blood, stimulate the tissues to increased metabolism, so raising the temperature of the body; this is their specific dynamic action. Since they cannot be stored, any excess taken in must be at once further broken down, whereby temperature is still further raised. Dr. Kipping concludes that in the tropics, proteins should be taken only sparingly during the hotter part of the day, the main protein meal being arranged to occur in the cooler evening. Where fruits are plentiful, the need for vitamins is supplied. Protein is more of a difficulty; 100 g., according to Voit, are required daily, but to get that from rice, for example, would compel the eating of five pounds daily, with a total caloric value of 5400, or about double what is required. The protein must not be supplied from a single source, as the right proportions of cystin, tyrosin, tryptophane, and the like, do not exist in every food. As to cellulose, Dr. Kipping holds strongly that there must be in the food some element, bulky, unabsorbable, and yet unirritating, to increase the mass of the intestinal contents and, by assisting peristalsis, to prevent constipation. This cellulose is easily obtained from fruits, salads, and bread made from coarse flour. After this evening protein meal, the office-worker can be quiet in a long chair, not further raising by muscular activity his temperature, already slightly raised by digestion. In Java, Dr. Kipping tells us, doctors not vegetarians in principle took to living exclusively on vegetable food. He puts forward himself the following scheme for food for a tropical day—Breakfast: tea or coffee, bread, butter, jam, pineapple or banana fritters, fruit. At midday: rice (not too much) with vegetables, salads, a little fish, fowl, or egg; all to be nicely cooked, but taken in small quantity. In the evening comes the main meat meal. The moral of Dr. Kipping's articles may be put briefly: Self-denial at lunch will keep you cooler through the afternoon.

[1] Archiv für Schiffs- u. Tropen-hygiene, 1923, pp. 177 and 404.

GENERAL PARALYSIS IN OLD AGE.

Dr. Paul Carretti,[1] who has devoted his inaugural thesis to the consideration of the clinical aspects of general paralysis in old age, records 19 cases in patients aged from 60 to 72, including two which came under his observation in the service of Dr. Capgras in the Maison Blanche Asylum. The course of the disease is, as a rule, more rapid in old age than in earlier life, and remissions do not occur. Although there are a few instances on record in which senile general paralysis has lasted several years, in the majority of cases the disease proves fatal within 12 months. The interval between the primary syphilitic lesion and the appearance of the first signs of general paralysis is very variable and does not affect the course of the disease. In two of Dr. Carretti's cases the first symptom of general paralysis appeared 12 years after the chancre, which is the ordinary period in adult life, but more frequently the syphilitic infection had been contracted much earlier—namely, 30, 40, or even 45 years before. Only three of the present series occurred in women, a fact which shows that the influence of sex persists in old age. The symptoms consist in dementia with all the features of senile enfeeblement, such as diminution of memory for recent events, impairment of affectivity and judgment, relative preservation of consciousness of a morbid state and of the moral sense, frequent absence of delirium, and focal signs of dementia such as paraphasia and agnosia. The cerebro-spinal syndrome, which consists in abundant lymphocytosis, a positive Wassermann reaction, moderate increase of albumin, and slight diminution of the sugar and chlorides in the cerebro-spinal fluid is constantly positive and is a valuable guide to the diagnosis of the condition, which otherwise might be mistaken for ordinary senile dementia.

[1] Thèse de Paris, 1923, No. 392.

ZOOLOGY AND EUGENICS.

IN the last four or five years a good many zoologists have been interested in the application of their science to the welfare of mankind, and it is round this central notion that a diversity of essays has been collected into one volume.[2] Prof. Holmes writes well and interestingly on many topics—the present tendency of evolutionary theory, heredity and the mind, the biological fortunes of the negro, birth control, panmixia and degeneration, civilisation and natural selection. He has the usual chapter on "our deteriorating inheritance," and draws the usual gloomy picture of the college graduates who won't heed, and the degenerates who heed too much. But he differs from most writers on this well-worn theme in pointing out that, while it is useful to control the multiplication of the mentally defective, it is far more important that those who chide such prolificity should themselves be fruitful. A community, he says, can do alright with a few degenerates if it has also great men and women who really make a difference in the world; the chief danger at present is a uniform mass of dull mediocrity. Biologically his doctrine is sound enough.

[2] Studies in Evolution and Eugenics. By S. J. Holmes, Ph.D., Professor of Zoology in the University of California. London: Routledge and Sons. 1923. Pp. 261. 12*s.* 6*d.*

As is well known, though seldom stated, it is impossible to make any very great difference in the prevalence of recessive characters like mental deficiency by segregating those in whom they are manifest; disastrous combinations of unrecognisable heterozygotes would go on producing a supply for a very long time, even if all mental defectives were killed at sight. But a deliberate and concerted attempt by college graduates to furnish a due supply of proper persons is a much better heeding proposition because the failures, who are not exceptionally gifted, will, in nearly all cases, be at least tolerably good citizens. We would commend his doctrine to eugenic propagandists. His discussion of the insoluble negro problem suggests that increasing urbanisation and decolorisation, with a birth-rate falling faster than the death-rate, may soon lead to a decline in their numbers in America, and possibly to their practical extinction. The paper on infantile mortality draws attention to the curious fact—not, of course, newly observed—that whooping-cough is the one cause of death which kills more girls than boys. Males are the frailer sex. In early fœtal life there is a great excess of males which at birth is reduced almost to equality, and in the first few years of life changes to a preponderance of females. Some of the essays are slight—e.g., those on sexual selection and the effect of birth control on fertility. None is very deep, but none is meant to be. The book is intended for general reading, and people with very varied interests will read it with profit.

BISMUTH IN THE TREATMENT OF INTERSTITIAL KERATITIS.

IN a paper headed "Is Parenchymatous Keratitis Curable?" Dr. G. Kleefeld[1] has drawn attention to the modern high standard by which complete recovery from interstitial keratitis is judged, improved illumination and the corneal microscope betraying permanent flaws which more primitive methods of examination fail to disclose. Even when vision has been restored to normal, Dr. Kleefeld has never failed to demonstrate with the corneal microscope persistence of white patches and corneal blood vessels formed during the acute stage of the disease. At least this was the case before he began giving injections of bismuth. In one of his cases, given bismuth, the patient came under treatment in the early stage of œdema of the cornea. Vision was already reduced to finger-counting, although the duration of the disease was only three weeks. Injections of bismuth were given without any great hopes, but after eight days the œdema of the cornea had largely disappeared, only two or three small vascular bundles having succeeded in penetrating the cornea. The treatment was continued, and the œdema disappeared so completely that when the patient was examined three months later even the corneal microscope failed to show any lesion. It is probable that complete recovery can be effected by specific treatment only before or during the stage of œdema; when this has passed off the patient's fate is settled for better or worse. In a second case, in which one eye after the other was involved, the injection of bismuth aborted the evolution of the keratitis in the second eye after several injections had saturated the body with bismuth. In a third case, in which sulpharsenol had been given for a long time without any relief, and there were signs of glaucoma on the left side, the injection of bismuth was followed by the complete disappearance of ocular congestion, a return of the intra-ocular pressure almost to normal, and by diminution of the corneal opacity. Dr. Kleefeld gives little information as to the dosage of bismuth adopted in these cases, but he sounds the warning that bismuth may prove toxic to the optic nerve, and he therefore advises caution in the dosage till more is known of the affinity of bismuth for the nervous system. Hitherto the treatment of interstitial keratitis with mercury, arsenic, and iodides has been very disappointing, and if Dr. Kleefeld's favourable experiences with bismuth are confirmed, the outlook for this class of patient should be much better than it has been in the past.

[1] Le Scalpel, Jan. 26th.

MENTAL DEFECT IN EARLY CHILDHOOD.

ALTHOUGH the literature dealing with mentally defective children of school ages is abundant, little has been written about mental defect at an earlier period, at the time when these children are brought to the practitioner for diagnosis, and when appropriate treatment might yield the greatest benefit. The subject of the symptoms, diagnosis, and treatment of mentally defective children was therefore chosen by Dr. John Thomson for the course of Morison lectures on mental disease, recently delivered in the Hall of the Royal College of Physicians of Edinburgh. The clinical material on which the lecturer drew consisted in the notes of 1200 cases, 952 of which had been under 5 years of age. In the matter of classification, Dr. Thomson holds that of Dr. A. F. Tredgold to be the best of those which attempt to combine pathology with clinical findings. Cases are divided into two large groups: (*a*) Primary amentia, in which there is an original incapacity of the cerebral neurons for proper development; (*b*) secondary amentia, which are due to an arrest of development of the brain, usually at a later stage from some extraneous or accidental cause. Dr. Tredgold, dealing with children of school age, or older, includes 85–90 per cent. of the cases in the primary group and 10–15 per cent. in the secondary. Dr. Thomson's figures, referring to younger children, are: Primary, 57 per cent.; secondary, 43 per cent. The difference would appear to be due to the fact that many cases of primary amentia are not recognised till they go to school, and many of the secondary cases die in infancy. The recognition of mental defect depends on two things—information from the mother and the doctor's examination. The mother may give valuable information about the labour, about other children, or miscarriages, or about the family history. On examination, especially in severe cases, some abnormality of appearance or behaviour may be noticed, such as an abnormally small head or a too early closed fontanelle. The signs of an easily recognised disease such as mongolism, cretinism, or microcephaly may be present. Regarding behaviour, unnatural gestures and grimaces, such as rolling of the eyes, may betray mental defect. Lack of natural curiosity or abnormal emotional displays are morbid signs. A series of epileptiform attacks without apparent cause is probably an indication of the presence of mental defect. The persistent recurrence of attacks of petit mal is ominous, as it is often accompanied by arrest in the normal growth of the cranium. In these severe cases the prognosis is very grave. In dealing with the milder cases prolonged study of the child under various circumstances may be necessary before the extent of damage can be estimated and suitable training selected. The normally developing child first of all exhibits aimless movements of the limbs, which gradually become purposive as they become stronger. The instinctive movements, such as crying, swallowing, and sneezing, although they are purposive, unlike the random movements, are at first equally involuntary. In time they become clearly intentional, and the baby can be observed making efforts to turn his head and to reach objects. After the first three months he begins to balance his head. Later he struggles to sit up, turning his head to look about him, and practising convergence of the eyes. Still later, he exerts his will in learning to crawl, to stand, and at length to walk. In the same way the use of senses is gradually acquired and perfected. Another sign that the baby's brain is developing is the increasing gratification derived from the normal functions of the body. If for any reason these are interfered with, as from blindness or deafness, the growth of the intelligence is appreciably retarded. Later he learns to guide his movements more by the

help of his senses, and so adds to his knowledge of life. This leads by association of various observed events to the growth of memory. As some instincts and reflexes develop into voluntary actions, so others develop into emotions, and with the increase in number and strength of these the child's character is formed. Imitation of spoken words leads him to the beginning of speech, though understanding and application of words come later. Before he is a year old he understands much of what is said to him and uses a few words himself. Sometimes even after a few months he has some control over reflexes, and considerable control over bladder and bowel is reached in the second or third year. If this is not reached at 3½ there is some fault of development, health, or training. When he begins to sit up, controlled retention of saliva becomes necessary and in this he soon succeeds, except at such times as irritation from teeth or gums has temporarily increased its amount. Failure to show these normal signs in the absence of organic cause must be regarded as probably due to mental defect. "Bad habits," such as thumb-sucking, air-swallowing, rumination, &c., are of important significance. A habit of constantly protruding the tongue is often seen in mongols and cretins shortly after birth. These habits are generally just an exaggeration of the normal, and should be vigorously checked as soon as possible.

With regard to simple primary amentia, a number of cases now classified under this head will certainly with greater knowledge of them be distinguished and transferred to groups of their own. Consanguinity and neurotic heredity are important ætiological factors. Convulsions are common, occurring in 13 per cent. of the cases. The diagnosis is made more by exclusion than by positive findings. "Microcephalus," or the term which is often loosely used, is not a common disease, and in the true cases the lesion is a primary defect of the brain cells. The cranium is very small with a narrow receding forehead, a pointed vertex, and flat occiput. The fontanelle is closed at birth, or within 4 or 5 months—a symptom peculiar to this disease. The smallness of the head, which may escape notice at birth, becomes more noticeable as time goes on. There is no true paralysis, though exaggerated hypertonicity may suggest spastic diplegia. The features are usually well-formed and ears large and fairly normal, but the palate is unduly arched. The mental defect varies in direct proportion to the size of the head. Cerebral development proceeds very slowly. After the early years of apathy these children often become active, restless, inquisitive, and mischievous. Convulsions occur in more than one-third of the cases, but the cause is quite unknown. The brain resembles that of the higher apes, and the cells are imperfectly developed. The prognosis both as regards life and mental improvement is unfavourable. Mongolism was present in 25 per cent. of Dr. Thomson's cases under 5 years of age, and in 45 per cent. of those under 1 year. Many of them die in early infancy, mostly from catarrhal diseases. The protrusion of the tongue—a constant feature—would appear to be due to the shortness of the oral cavity rather than to undue size of the tongue. There are many signs of backwardness and imperfection in development. In disposition and character, although the infant may be rather dull at first, it soon becomes bright, cheerful, good-tempered, and affectionate. These children are especially apt at mimicry and, like cretins, cleanly and tidy in their habits. Of the congenital malformations, which are common, the commonest is congenital malformation of the heart, being present in 15·7 per cent. of the cases. The mongol has loss of powers of resistance to organismal infection, so that blepharitis is almost constant (over 90 per cent.). Their typical appearance makes the diagnosis easy. The prognosis is unfavourable both as regards life and mental improvement. Some perversion of endocrine development would seem to be an ætiological factor. A striking fact is that the average age of the mother was 37½ years. Thyroid treatment does not seem to be of much value. Sporadic cretins are much less common than mongols. The mental defects form a parallel with the well-known bodily defects, resulting from the faulty metabolism consequent on the absence of thyroid secretion. The diagnosis in doubtful cases can be rapidly settled by the striking improvement which follows on the administration of thyroid extract. Dr. Thomson holds that premature babies are much more liable than full-time infants to intracranial hæmorrhages. In diagnosis the history is most helpful, revealing a severe labour, prematurity, damage to the head apparent after birth, collapsed and asphyxiated condition of the child when born, or other suggestive information. The mental symptoms are mostly the same as those in other defective babies, although they appear worse in children with spastic muscles. The prognosis is more favourable than might be supposed, the restriction of movements often being overcome in time as a result of training.

In his concluding remarks Dr. Thomson laid stress on ante-natal work in the prevention of mental defect from birth injury.

THE DETERMINATION OF ACUITY OF VISION.

THE determination of the acuity of vision by test-types has been practised for over 60 years with but slight modification of technique. Snellen's type, in common use, is based on the assumption that the normal eye is capable of distinguishing the shape of an object the linear dimensions of which subtend an angle of five minutes, while its component lines subtend an angle of one minute, and that the acuity of those eyes which need a larger visual angle may be expressed as a fraction of the normal in proportion to the size of the angle required. It has stood the test of time, and no one has suggested any alteration in principle, but in the details of application it is not to be expected that no improvement is possible. Prof. John Green and Prof. A. E. Ewing have devised new optotypes[1] for which they claim three advantages. The first is that by grading the size of the different letters by geometrical progression the new test is made more scientific. The question, however, arises Is the advantage to be gained from it sufficient to outweigh the inconvenience of having to translate all records made by the old nomenclature into the new for purposes of comparison? The second advantage claimed for the new types is that they simplify the routine and enlarge the scope of trustworthy clinical determinations, by providing varied sequences and arrangements of the test-letters and other characters. Single letters diminishing in size have undoubtedly been found of practical value by shortening the time required for initial tests and so minimising fatigue on the part of the patient. With young children and illiterates it is impossible to utilise the type ordinarily found in our out-patient rooms. Various simple figures and pictures have been devised at different times to meet the difficulty. The trident devised by Snellen assumes more patience and intelligence on the part of the patient than is often forthcoming. For Prof. Green's characters, on the other hand, it is claimed that the vision of squinting children of 3 or 4 years of age can be accurately measured. Again, for mutes and deaf-mutes a page of type is provided upon which they may indicate the character or letter seen upon the test-card. The third advantage claimed is that the differences in the legibility of the several test-letters—a difference of which all experienced with ordinary test-type are aware—is minimised by appropriate choice of letters and a conservative change in the typographical character. We can recommend these test-types as a valuable addition to the consulting room, though we do not think they are likely to supplant those in ordinary use.

[1] Optotypes Consisting of Test-letters and Picographs for Measuring the Acuteness of Vision. By John Green, M.D., Professor of Ophthalmology in St. Louis Medical College; and A. E. Ewing, M.D., Emeritus Professor of Ophthalmology in Washington University. With 35 engraved plates. London: Henry Kimpton. 1923. 25s.

THE HEALTH OF HONG-KONG.

A REPORT on the health of the civilian population of Hong-Kong in 1922 is now available, and contains matter of interest. The population concerned is estimated at 662,200, of which total 15,200 are British and foreign civilians, the remainder being Chinese. The general death-rate was 25·16, for Chinese 25·47, and for non-Chinese civilians 20·46 per 1000. With regard to the chief prevalences of disease, plague heads the list with 1181 cases, as compared with 150 in the previous year; all of these cases but seven occurred among the Chinese population, and there was only one case among Europeans; 938 of the cases were notified in April, May, and June. Three species of the rat family are found in the colony, *Mus norvegicus* (the brown rat), *M. rattus*, and *M. musculus*, the respective percentages of the three forms being 41, 32, and 27. During the last nine years 85 per cent. of the rats examined and found to be infected with the plague organism were of the brown, and only 15 per cent. of the black species; the fleas known to be present are *Xenopsylla cheopis*, and *Ctenocephalus felis* and *canis*. Every precaution is taken to prevent rats from gaining access to buildings, such as provision of concrete for ground surfaces, and iron gratings for drains and ventilators, the use of kerosene emulsion for cleansing native dwellings every three months, and provision of covered metal dustbins; all buildings found to be infected are washed with kerosene emulsion, and clothing disinfected by steam heat. Rats probably enter the colony by means of shipping, especially in junks, of which "some four or five thousand would have to be dealt with"; a large organisation is therefore required.

Dr. J. T. C. Johnson, principal civil medical officer, who submits the report, discusses the question of the mode of transmission of leprosy. He considers that the infection is conveyed

"by some article of food, and the particular food which is in universal demand, wherever leprosy is found, is imperfectly cured or salted fish. At all times, and in almost every country where leprosy occurs, popular belief has associated it with the use of fish. Against this view it has been asserted that there are many races and peoples among whom leprosy prevails who do not eat fish because of religious scruples, or because they live in the interior of the country and are not able to get it. This has been abundantly refuted whenever the question has been thoroughly investigated. It has been asserted of India, Ceylon, Persia, Africa, but it appears to have been a statement based on preconceived opinion."

The Chinese themselves believe the disease to be contagious, and segregate such patients in leper villages. Dr. Johnson himself adopts the late Sir Jonathan Hutchinson's view, that leprosy is not contagious in the ordinary sense, and considers that the evidence for the fish hypothesis "seems to amount to a high degree of probability." He does not, however, refer to the possibility of infection through bites of insects, such as bugs and mosquitoes.

BY the death of Sir James Walter Mackay Simpson Bart., who died on March 16th in London, aged 41, the baronetcy conferred on his grandfather, the famous James Young Simpson, becomes extinct.

A SPECIAL meeting of Fellows will be held at the house of the Royal Society of Medicine on April 10th, at 5 P.M., to receive the medical officers of health who are visiting this country at the request of the League of Nations. Some 50 medical officers are expected, and Dr. Rajchman, medical director of the League of Nations Secretariat, will deliver a short account of the work of the League of Nations Health Organisation. The Minister of Health and Lord Parmoor, the British member of the Council of the League, will be present. The President of the Society, Sir William Hale-White, will preside. All members of the medical profession are invited to attend. Tea and coffee will be served at 4.30 P.M.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXIII.
INCREASING DEAFNESS IN ELDERLY PEOPLE.

IN "Rabbi Ben Ezra" Browning's picture of old age is much too optimistic. On the other hand, the Preacher in the twelfth chapter of Ecclesiastes is unnecessarily gloomy, as when he writes "all the daughters of music shall be brought low." Deafness is, nevertheless, one of the most common, as well as one of the most distressing accompaniments in the later registers of life; and it is the physician's duty to find out if anything can be done to alleviate it.

Criteria of Senile Deafness.

The first and most important step is to make quite sure that the patient is really suffering from senile deafness. In my experience the most common and most serious mistake is in making the assumption that because an elderly person is becoming deaf, the case is one of senile deafness. This mistake occurs the more frequently because the assumption has usually been made by the patient himself and by his friends. As a matter of fact, Eustachian and middle-ear catarrh are by no means uncommon in elderly people, and such cases may obtain very great relief by treatment.

The *age of onset* varies within comparatively wide limits. Senile deafness may begin as early as 60, or even before, or it may not make its appearance until 80. The onset is always gradual. A curious feature of the condition is the fact that the loss of hearing begins at the upper end of the musical scale, while the hearing for notes of low pitch is retained for a long time. Thus, frequently the first indication the patient has of his deafness is his inability to hear singing birds, especially the lark; whereas for the ordinary affairs of life, such as conversation, his hearing is as good as it ever was. As time goes on, however, the hearing power for the lower notes becomes affected and the deafness then becomes a serious trouble in the patient's life.

Absence of Tinnitus and Vertigo.—In uncomplicated cases of senile deafness the sufferer is almost always spared from the added burden of tinnitus or noises in the ears or head. This is a common and sometimes the most distressing symptom of ear disease, and it is perhaps remarkable that it is not an accompaniment of senile deafness. It must be remembered that tinnitus may occur in old people who are at the same time deaf. But here it will usually be found that the deafness is not of the uncomplicated senile type, but is associated with some other condition, such as the later stages of oto-sclerosis, which has been in existence long before the patient became old. It may also be due to arterial changes in the blood-vessels supplying the labyrinth, as in arteriosclerosis.

The sufferer from senile deafness is fortunately also spared, as a rule, from another common symptom of inner ear disease, vertigo. When this symptom is present the case is not one of uncomplicated senile deafness, but rather one of internal ear disease due to some constitutional condition such as arterio-sclerosis, or to some local change such as the deposition of calcareous salts in the vestibule or in the ampullæ of the semi-circular canals.

Rules for Differential Diagnosis.

The diagnosis of senile deafness is not difficult in uncomplicated cases if the physician will take the trouble to follow a few simple rules. On inspection through the aural speculum the presence or absence of wax in the meatus, or of the existence of suppurative middle ear can be determined. It is not uncommon to find milk-white deposits of calcareous salts in the tympanic membrane of elderly

people; and, indeed, they are sometimes found in younger individuals. They cannot be looked upon, however, as being the cause of deafness, for they may be found in individuals whose hearing is not appreciably affected. Their occurrence should be remembered by the physician, because if the tympanic cavity be inflated too violently, either by means of the catheter or the air-douche, the sharp edges of the crystals may tear the membrane and give rise to a perforation. Fortunately, such perforations heal rapidly provided antiseptic fluids or applications are not introduced into the meatus. Inspection may sometimes reveal the presence of indrawing of the membrane. But too much reliance must not be placed upon the position of the handle of the malleus, since this varies within fairly wide limits in individuals possessed of normal hearing. The same is true of the degree of opacity of the membrane, for this also varies greatly in normal persons. As already stated, elderly people suffer in particular from a loss of hearing for notes of high pitch. This is tested for by means of Galton's whistle. The hearing power for the low notes is ascertained by the employment of deep-toned tuning-forks, as these are the only instruments which give notes sufficiently free from overtones to be reliable. If the case is one of uncomplicated senile deafness in the earlier stages, the physician will be surprised how comparatively well these low notes are heard. In the late stages of senile deafness the patient loses the hearing for all notes unless they are sounded loudly.

Testing the hearing by bone-conduction is frequently of use in establishing a diagnosis. In cases of middle-ear deafness the patient hears the sound of a tuning-fork when held with its stem against the mastoid process, as long or longer than normal individuals. Where the deafness is due to internal ear disease—e.g., senile deafness—the fork when held in the position described is heard for a shorter time than is the case in those possessed of normal hearing.

Inflation of the Middle Ear.—But far the most important of the tests is that which is concerned with the effect of inflation of the middle ear. Not only is this a most important diagnostic matter, but it is at the same time an indication for treatment, and, in some cases, the most important means of treatment. Inflation of the middle ear, therefore, must be performed methodically in all cases. The procedure is as follows. Before inflation the hearing distance for the watch, the whispered voice, and the conversation voice must be determined and noted. Inflation of the middle ear is then undertaken. This must be done by means of the Eustachian catheter and with one end of the auscultation tube in the external meatus of the patient and the other end in that of the examiner. On no account must the physician trust to the effects of the air-douche associated with the simultaneous swallowing of a mouthful of water. Nor must he rely on the statement of the patient that "he has felt the air go up to his ears." The clear, unmistakable rush of air into the middle ear must be heard through the auscultation tube by the examiner, who must not rest satisfied until this occurs. Having assured himself that the middle ear has thus been thoroughly inflated, the hearing distances for the watch, the whispered voice and the conversation voice are again tested by the examiner, and the results compared with those found before inflation. If a definite increase in the hearing distance is found, then there is no doubt that the deafness is due, in part at least, to middle-ear disease; though, of course, disease of the inner ear may also be present.

Indications for Treatment.

The indications for treatment depend for the most part upon the result of inflation of the middle ear. If distinct improvement has occurred, then it will usually be found that some affection of the nasal cavities is present, such as chronic nasal catarrh, polypus, hypertrophy of the turbinated bodies, &c. These conditions must be treated by cauterising or by removal, as the case may be, but common-sense must be the physician's guide in this matter, and he must remember that the treatment must not be too heroic in old people. In mild cases simple treatment by sprays such as menthol in parolein (5 per cent. solution), &c., are sufficient. When the nasal condition is rectified so far as possible, the middle ear should be inflated by the catheter two or three times a week so long as improvement continues, which may be for several weeks. When no further improvement occurs the treatment should be stopped for the time being. It will frequently be found, however, that the dullness of hearing gradually returns. In such cases the inflations must be repeated every few months; the possession of their hearing means so much to them that elderly people are not only willing, but anxious, to have the treatment repeated. If, on the other hand, no improvement results from inflation of the middle ear the first time it is carried out, then nothing can be hoped for from that treatment by repetition. That is to say, if any benefit is to be derived from inflation it will be obvious from the first. In cases where no such improvement occurs the deafness is due to inner-ear disease, or less likely, to a middle-ear condition which cannot be remedied. In old people it will usually be due to true senile deafness. In these cases little can be hoped for by any line of treatment directed locally to the ear. The most that can be done is to try, by improving the general constitutional condition, to prevent the deafness from becoming worse, or at least to render its progress as slow as possible. If any local centres of septic infection are present, such as cystitis associated with enlarged prostate, these would naturally receive attention. Abundant hours of sleep should be advised, but these should be procured without resort to hypnotics, which usually have a bad effect upon the hearing.

Severe tinnitus is fortunately not common in the aged. When present, it is a most difficult condition to treat, and gives rise to great distress. The administration of bromides, at bed-time particularly, is quite permissible in these cases, because the patient would rather be free of the tinnitus even though the treatment involved some increase in the deafness. Furthermore, the tinnitus when severe is apt to interfere with sleep, and when this is the case a suitable hypnotic is desirable.

Artificial Aids.

When relief is not procurable by the means described above, the question arises whether benefit may be obtained by the use of one of the artificial aids to hearing. In regard to this matter, experience shows that so long as the deafness is slight in degree the patient prefers to do without these instruments. With increase of the deafness, however, many sufferers find them of great benefit, and are willing to make use of them. The kind of instrument to be recommended varies according to the degree of deafness. In cases where the deafness is great, then it will be found that the most useful type of instrument are those devised upon the principle of the telephone or microphone—e.g., the acousticon or acoustique. The chief objection to these instruments is the jarring brassy tone which they impart to the voice. So much is this the case that some individuals refuse to make use of them under any circumstances. For these sufferers the simple old-fashioned ear-trumpet is often quite effective if the deafness is moderate in degree, but is of little use in cases of great deafness.

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Special Articles.

AN INVESTIGATION INTO THE PRESENT HEALTH OF GERMAN CHILDREN.

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IN view of the contradictory reports concerning the health of children in Germany, it may be of interest to outline briefly the results of an investigation by the writers in Germany during February, 1924. Speaking broadly, it may be said that the conditions of child health in many German industrial towns bear numerous points of resemblance to those obtaining in Vienna in the post-war period, when for 20 months one of us was working in that city as a member of a unit sent out by the Medical Research Council and Lister Institute to investigate rickets in infants and young children. In the course of the present investigation the following towns were visited: Berlin, Leipzig, Munich, Mainz, Cologne, Essen and some of the smaller towns of the Ruhr, Breslau and the surrounding mining districts, Freiberg, Nuremburg, and Dresden.

Before describing the lines of inquiry, it is necessary to mention some of the difficulties of such an investigation. German economic and social conditions have changed rapidly, being successively affected by the privations of the later years of the war, by the partial famine conditions of 1919 and early 1920, by the period of recovery of 1921 and 1922, and finally by the disorganisation associated with the collapse of the mark in the autumn of 1923, followed by the present period of stabilisation. Each of these periods is reflected in the state of the children at varying ages in Germany to-day. Two of the principal difficulties in instituting any comparisons are: First, that statistics now obtainable in Germany have necessarily become imperfect and are not up to date; and secondly, that few of the statistics to which we have had access in this country are strictly comparable. Racial differences, the varying conditions in different parts of Germany, and among different classes of people, together with the different standards that exist in Germany, as compared with this country, in such matters as adequate clothing, &c., further obscure the real position.

The following were the lines on which the inquiry was conducted: (1) social investigation; (2) investigation of food consumption; (3) examination of the child; (4) evidence of malnutrition from disease incidence; and (5) general statistics.

Social Investigation.—This was largely outside our scope, but it is worth mentioning that the unemployment dole in Germany is about 7 or 8 Renten Marks a week for a man with a family, equivalent in buying power to a little over 7*s.* or 8*s.*, and the number of unemployed and partially employed is greater than in this country. It is obvious that this amount is insufficient for the maintenance of health, although one must remember that rents are often negligible.

Investigation of Food Consumption.—The most important factor in connexion with the food of small children is that milk and sugar have risen to twice their pre-war price, whereas flour is at about pre-war price. There is consequently a growing tendency to substitute flour and water for milk in their dietary. Moreover, owing presumably to the shortage of oil-cake, it was necessary during the war to reduce the official standard for butter fat in milk from 3 per cent. to 2·7 per cent., which still obtains. The milk production of Germany has dropped greatly, and is estimated at about 30 per cent. of the pre-war quantity. A still further shortage has resulted from the interference with the transport of milk from the country to the towns. This applies particularly to the Ruhr district, which in pre-war days imported a large proportion of its milk. Consequently, in many towns there is an absolute shortage of sufficient milk for the infants and children, whereas in others the milk-supply for these groups is sufficient, but the price is prohibitive, excepting for that supplied free or at reduced price for the use of infants, and in most districts for children up to about 2 years of age. Many children get sufficient calories, but suffer from improper balance in the diet. At the present time the brunt of the milk shortage appears to fall on children from 1 to 5; those under 1 year are, in general, receiving sufficient milk. Inquiry as to the food consumption in the preceding 24 hours is apt to be unsatisfactory, though by questioning large numbers valuable information may be obtained. Mothers tend either to exaggerate the want, or, in the majority of cases, are ashamed to say how little food they have had; and in the case of a child the tendency to repeat another child's statement or to say what he thinks is expected of him, is well known. Generally speaking, in every school that was visited, children in the higher classes were questioned, and of the hundreds of children examined the majority had meat only once a week, and margarine or other fat either for breakfast or tea. In some towns few of the children questioned had any form of fat on their bread. The midday meal generally consisted of black bread and vegetables, and in the poorest schools it was usual to find one or two children in each class who had had no food before leaving home in the morning.

Examination of the Child.—In order to examine unselected samples of the poorer child population, infant welfare centres, kindergartens, and schools were inspected in the poorest districts of each town visited, and the condition of the children with regard to physique, colour, amount of subcutaneous fat, evidence of tiredness—e.g., bad posture and dark rings under the eyes—and degree of activity were noted. From these observations the conclusion was reached that compared with British children, as known to us—i.e., in London and north country industrial towns—a low standard of health is more general in the towns we visited, and is to be found widely in children of all social classes—middle-class children are to be found in the poorest schools. We found no evidence of acute starvation in any group of children, except those of Breslau and the surrounding district. The condition of the children varies greatly from town to town—more stunting of growth was observed in the school-children of the Breslau and Essen districts than among any others. In some towns, such as Mainz, the overcrowding due to the large additional population caused by the occupation is probably a factor of great importance in producing the almost universal appearance of tiredness in the school-children.

Prof. Rudolf Martin, of Munich Anthropological Institute, has figures of great value concerning the physique of school-children, and has been able to institute a comparison between the heights and weights of Munich children in pre-war days, in 1921 and in 1923. Together with the heights and weights he has a large series of other measurements, and had hoped year by year to obtain data which would increase the meagre amount of knowledge now existing concerning the ultimate physique of children who had suffered from privation at varying ages. He excludes all children showing evidence of disease, for instance, rickets, so that no comparison is possible between his figures and those for children in English towns. His pre-war standard is taken from figures for about 12,000 children in Freiburg-im-Breisgau, Apolda, and Frankfurt-am-Main, and from comparison with pre-war Munich figures he has reason to believe that these figures also represent the Munich standard. His own measurements at the Anthropological Institute comprise several thousand children. Com-

pared to the pre-war standard, the 1921 standard in Munich was approximately 2–6 cm. less in height and 1–4¾ kilo. less in weight at each year of school age. Since there seems little doubt that the amount and severity of rickets have increased, the deterioration is greater than is shown by figures from which the diseased have been intentionally excluded. For 1923, on account of the poverty of the institute, Prof. Martin has only been able to obtain figures for children aged 6½–8½ years. The 6½–7½ year-old children show no significant change, but those aged 8–8½ years show a definitely poorer physique in 1923 than in 1921, the retrogression in 8½ year-old boys

FIG. 1.

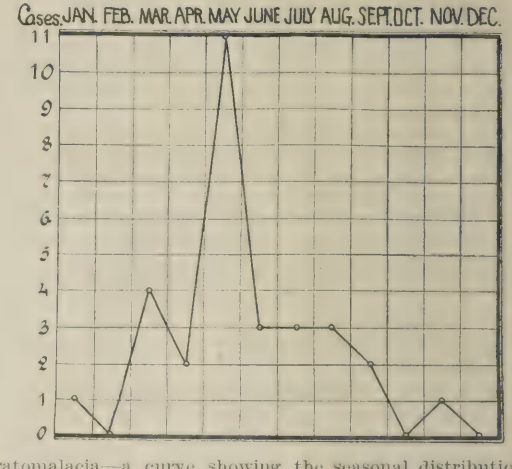
A case of hunger œdema following pure carbohydrate diet. January, 1924. The child is shown before and after treatment; the photographs were taken in the Breslau University Kinderklinik, and are reproduced by permission of Prof. Stolte.

being 4 cm. in height and 1·7 kilo. in weight, and for 8½ year-old girls 2·4 cm. and 0·9 kilo. respectively. Figures from Stuttgart and Mannheim show that in those towns, unlike Munich, the average heights and weights of school-children had risen by 1921 22 to approximately the pre-war standard, but no figures later than 1922 are available. An improvement from year to year between 1918 and 1921 can also be seen in the height and weight curves of Leipzig school-children. Prof. Martin's work would indicate a reversal of this process of improvement between 1921 and 1923, which is in accordance with the general impressions of nearly all medical authorities. On the other hand, the height and weight curves of the Leipzig school-children of 1918, 1919, 1920, and 1921 were, for almost all ages, better than the corresponding curves of Glasgow school-children for 1922–23. It must be remembered, however, that possible racial differences prevent any final conclusions being drawn from such figures. The so-called Rohrer index, $\frac{(\text{weight} \times 100)}{\text{height}^3}$, has been extensively used in Germany for purposes of comparing the standard of physical development attained by the children of different areas, and appears to be of value for mass work, but no similar figures exist in this country. Such weight-height indices seem of little use in estimating the condition of the individual.

Evidence of Malnutrition from Disease Incidence.

(*a*) *Nutritional Diseases.*—During the whole period of our stay in Germany only two cases of acute starvation were seen, both in the Breslau district. In this region a certain number of cases of hunger œdema in children of school age and under were admitted to hospital during the last few months, and similar cases were reported in Cologne (see photographs). No cases of hunger osteomalacia in adults were seen, though there were reports of a considerable number of such cases during the blockade period. Nearly all medical authorities are agreed that, as happened in Vienna, there has been a marked increase in the amount of rickets as compared with the pre-war period. This condition is, of course, due to defective hygienic as well as dietetic conditions, and therefore is to some extent an index of increased poverty. On account of the varying standards of diagnosis, general figures are of little value, but such figures as the following seem to indicate a very definite increase. In Schöneberg, a section of Berlin, 20·7 per cent. of all 6-year old children attending school now show evidence of rickets, according to the report of the school medical officer, whereas the corresponding figure for 1913 was 5·2 per cent. There appears to have been in some districts an increase of rickets in the present winter as compared with the winters of 1920–21 to 1922–23. For example, in the infant and child welfare centre associated with Prof. Rott of Berlin, 20 per cent. of the total children examined had evidence of rickets in the last quarter of 1922, and in the corresponding quarter of 1923 this figure rose to 40 per cent. Dr. Wendenburg of Gelsenkirchen in the Ruhr area, finds in breast-fed infants aged 3 to 5 months attending the welfare centres of the town, nearly 25 per cent. with craniotabes in the present winter. During the previous two winters, scarcely any craniotabes was to be found in such infants, but during the winter of 1919–20, when privation was severe, 50 per cent. had craniotabes. Keratomalacia is increasing in Germany after, we understand, an interval of comparative freedom since the blockade. Prof. Stolte, of Breslau University Kinderklinik, informed us that from the years 1912 to 1921 only 10 cases of this disease had been seen at his clinics, whereas 30 cases occurred in 1922, showing the usual increase in the spring months (see curve, Fig. 2). In Waldenburg (population

FIG. 2.



Keratomalacia—a curve showing the seasonal distribution of 30 cases treated at the Breslau University Kinderklinik, 1922. Reproduced from the paper by Dr. Richard Galka, Monatschr. für Kinderheilkunde, XXVI.

40,000) there have been 30 cases within the last few months, and cases have occurred in infants fed entirely at the breast, which presumably may be taken to indicate an extreme fat deficiency in the diet of the mothers. Cases are also reported during the past year in the University Kinderkliniks of Berlin and Leipzig by Profs. Czerny and Bessau. As was the case in Austria, there appears to have been an increase in infantile scurvy since the pre-war period, which is probably to be associated with the consumption of stale milk, and a few cases have occurred in breast-fed infants whose mothers were presumably also suffering from the disease. It may be of interest to compare the very heavy incidence of scurvy in Russia in young children in the year following that of the famine.

Diseases due to Lessened Resistance.

It is widely held that faulty nutrition has led to greatly diminished powers of resistance in children. No support for such a theory can, however, be found in the German statistics of deaths from scarlet fever, measles, diphtheria, or whooping-cough, all of which have shown a steady decline during the last decade. The death-rate from tuberculosis was roughly doubled in 1919 as compared with 1914, but fell steadily in 1920 and 1921, and showed a slight increase in 1923. For the third quarter of 1923 in the 46 largest towns the rate was 14·7 per 10,000 per annum. The London death-rate for the whole of 1922 was 12·8.

It is known, on the other hand, that an increase of tuberculosis is not immediately apparent in the death-rate, and there is a general consensus of medical opinion in Germany that tuberculosis has increased, particularly among children. It is quite impossible to get any reliable general statistics, but figures such as the following are suggestive: In Freiburg, in 1914, out of a total of 3178 students in the University, 10 were diagnosed as pulmonary tuberculosis; in 1922, out of a total of 3667 students, 93 cases of phthisis were diagnosed. Prof. Ranke, the well-known authority on tuberculosis, informed us that in 1922 of 4816 new cases attending clinics under his charge, 17 per cent. were suffering from open tuberculosis. In 1923, of 3209 new cases, 31 per cent. had open tuberculosis. In 1922, among school-children in Schöneberg, 0·4 per cent. were diagnosed as cases of tuberculosis of the lungs, as against 0·1 per cent. in 1913. It may be of interest to compare the figures for London County Council schools in 1923. Owing to the differing standards of clinical diagnosis no final conclusions can be drawn from them, although the difference is very marked—among 242,145 L.C.C. school-children 89 were diagnosed as definite cases of lung tuberculosis (i.e., 0·037 per cent., as against 0·4 per cent.).

In Berlin, out of 1000 infants 10 per cent. recently gave a positive tuberculin reaction, whereas formerly this figure was only about 3 per cent. Prof. Mayer of Munich gives almost exactly similar figures for his home for infants of 100 beds; the pre-war figure was 2–3 per cent., the present figure 10 per cent. Figures of increased attendances of cases of tuberculosis at individual institutions are apt to be misleading, as out of a total of 40,000 beds in tuberculosis hospitals and sanatoria 4100 have been closed on account of want of funds—therefore, no such figures are included in this paper.

We did not hear of any cases of cancrum oris. This is in marked contrast to the large amount of this disease seen in Russia during the famine.

Statistics.

The only general statistics of any value (apart from those already mentioned) are the general death-rate and the infantile mortality-rate. The death-rate for the 46 largest towns in Germany was lower in almost every month in 1923 than in 1922. The death-rate for the first quarter in 1923 was at the rate of 17·3 per 1000 per annum, and for the corresponding period in 1913 was 16·8 per 1000. The infantile mortality-rate has dropped considerably since before the war, though it has for years been higher than it is in this country. In the 46 towns previously mentioned there is an increase in the third quarter of 1923, as compared with the third quarter of 1922 (114 to 138). No later figures are available. In the last quarter of 1923 the infantile mortality-rate per 1000 in individual towns was: London, 67; Berlin, 124; Breslau, 148; Cologne, 106; Dresden, 93; Frankfurt, 71; Munich, 117.

The improvement in the infantile death-rate since pre-war days is probably brought about primarily by increased breast feeding, due partly to poverty and the giving of a small bonus for breast feeding and partly to the teaching of the welfare centres. In Munich, for instance, the amount of breast feeding at the beginning of the century was estimated at 25 per cent. and is now about 70 per cent., the death-rate in breast-fed babies between 1916 and 1919 was 103, and in artificially fed infants 219. The fact that the general infantile death-rate for the third quarter of 1923 showed no great rise is conclusive evidence that, up to that time, no severe privation had fallen on this section of the community.

Conclusions.

Throughout the investigation one of the greatest difficulties was that of separating the effects of previous periods of under-nourishment from malnutrition due to present conditions. As a group the infants appear to suffer least at the present time in Germany, and the weight at birth appears to be unaffected by the malnutrition of the mothers—a statement true also in Vienna throughout the post-war period. The group of children most affected are those from 2 to 5 years. This is well shown in the following table, indicating the general falling-off in weight during successive years of a group of children attending the welfare centres in Neukölln, a district of Berlin:—

Years.	Percentage of all children under weight.	Normal weight (per cent.).	Over weight (per cent.).
1–2	41	45	14
3–4	70	23	7
4–5	75	16	9
5–6	86·5	13	0·5

Generally speaking, boys appear to be less well-nourished and to suffer more in health than girls of the same age. The same held true in Austria during the time of privation, and is possibly to be attributed to the lesser activity of the girls. As compared with the British working-class standard, we considered a low standard of health more general, but the clothing of the children, except in two towns visited, was almost uniformly good. The footgear in many cases was, however, bad.

There is undoubtedly a definite deterioration in the physique of German children aged 2 to 14 since the beginning of the war. It is universally believed by German medical men that physique improved during the years 1921–22, and this is borne out by the figures available of the weights and heights of school-children, but it is probable that considerable sections of the child population are again deteriorating. More is at present being done to supplement the diet of school-children than of those under school age. There is no evidence of acute starvation of any extent among children in Germany, but a large section of those between 1 and 5 are suffering from an insufficient or ill-balanced diet.

In conclusion, we should like to express our indebtedness to the many members of the medical profession in Germany, and to those concerned in the care of children who freely put at our disposal all the information and facilities for which we asked, as without their constant help this investigation could not possibly have been carried out.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Committee 29 cases were considered and £141 10s. voted to 28 applicants. The following is a summary of the three new cases relieved.

L.M.S.S.A., age 57, who practised in Essex. Since 1921 his ill-health required the constant attention of his wife who on this account had to give up a small business. Their total income now amounts to about 25s. per week. They live in a small bungalow which they purchased by money obtained on loan and a mortgage, the interest of which is £26 per annum and the rates £8 per annum. Voted £26 in 12 monthly instalments and a Special Grant of £5.

Daughter, age 66, of a surgeon who practised in Devon and died in 1870. Applicant's capital was expended in supporting a sister who was ill with consumption for four years before she died. She is now left with an annual income of £38, and gifts from friends amount to about £20, and she lives with a brother who finds her a shelter. Voted £10 in two instalments.

Widow, age 73, of F.R.C.P. Edin. who was an army doctor and later practised in Hampshire. Her husband died without making any provision. Applicant lost her income through a fraudulent trustee. Both her children are in financial difficulties and are unable to help in any way. In consequence of ill-health applicant is unable to earn. Voted £18 in 12 monthly instalments.

Subscriptions may be sent to the hon. treasurer, Sir Charters Symonds, K.B.E., C.B., M.S., at 11, Chandos-street Cavendish-square, London, W. 1.

THE DIFFERENTIAL DIAGNOSIS AND THE PREVENTION OF SMALL-POX.

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(*Concluded from p. 563.*)

The Prevention of Small-pox.

As a preface to this part of the subject I have to say that I am not concerned with the defence of the prophylactic value of vaccinia. The inoculation of vaccinia, if it is efficient and sufficiently recent, prevents small-pox. It is our only prophylactic.

During a recent investigation of an outbreak of the disease, I made a note of the following circumstances in connexion with a family of nine children. The mother stated that eight of her children had been attacked by the disease, and that none of the eight had been vaccinated. Every one of the eight showed evidence of a recent eruption which was consistent with the mother's statement, and with small-pox. The mother also stated that the ninth child had not been attacked by the disease, and that this child had been vaccinated. She was 11 years of age. She had no signs of having had an eruption and showed four vaccination scars, well pitted and of an area exceeding half an inch. I have quoted this case, not because the circumstances are in any way remarkable, but simply for the purpose of illustrating what is really meant by prevention of small-pox. If the other eight children had been in the same condition as the ninth the disease would not have appeared in this family. It would have been prevented. And so with other families, and so with the whole of our population.

We cannot entirely prevent the importation of the infection, nor, I believe, can we prevent the occurrence of a number of secondary cases among the people. But we can prepare ourselves to meet any importation of the disease, and we can so narrowly restrict the number of secondary cases that we shall be free from the constant menace of endemic small-pox and the ever-present risk of wide-spread epidemics of the disease. So for practical purposes one may say that the prevention of small-pox means the removal of the menace of small-pox, and the only means by which we can remove this menace is by increasing the immunity of the people. Prevention of small-pox therefore implies that the protective inoculation of vaccinia must anticipate the advent of the infection, and if we postpone the use of vaccination until the disease has appeared among the people, we are neglecting prevention and pretending to regard the presence of small-pox with all the social and commercial disturbances which accompany it, as an inevitable evil, although we are quite well aware that it is the most preventable of the infectious diseases.

Postponement of Use of Vaccinia till Small-pox has Appeared.

There are some among us who affirm their confidence in the prophylactic value of vaccinia, and yet do not hesitate to express the opinion, and to present the opinion as a guide for public policy, that we may safely neglect to employ the full power of prophylaxis, that the use of vaccinia may be safely postponed until the disease has appeared. The reason stated to underlie this opinion is that small-pox in the vaccinated but incompletely protected individual is apt to cause difficulty in diagnosis, and that missed cases therefore occur which spread the infection. I am not inclined to believe that this is a very frequent cause of missed cases. A neglect to exclude small-pox in course of diagnosis is certainly a common source of error. Even if difficulty arises because vaccinia has partly lost its efficacy through lapse of time or inefficient administration, that is no reason for advocating the less complete use of the prophylactic. It is a cogent reason for advocating the reinforcement of immunity. Recent experience in this country also shows that mild small-pox in the unvaccinated may give rise to similar difficulty.

The neglect of prophylaxis in this country and the result of that neglect are emphasised by Sir George Newman in his last report on the state of the public health. Under the heading The Present Situation, the Chief Medical Officer of the Ministry of Health states that the vaccination of infants has declined to 38 per cent., and goes on to say: "The administration of our vaccination laws may be open to criticism, and steps have been taken in the present year further to improve this administration. It is obvious that the vaccination laws themselves are in need of amendment."

For the purpose of debate I desire to make a few suggestions in the direction of strengthening the law and so enabling it more nearly to attain its object, the prevention of small-pox.

There is a great necessity for education of the people in the simple facts which underlie the production of immunity. The energy displayed in these days by sections of the public press in harrying small-pox nests is very admirable in intention, but is often misdirected on account of want of knowledge or appreciation of the true meaning and scope of protective inoculation. In an article dealing with the neglect of vaccination in a district where small-pox was rife the following sentence appeared: "The ordinary sane citizen, by the way, has a conscientious objection to being put in peril of a loathsome disease by the selfish obstinacy of a gang of fanatical fools." The "ordinary sane citizen" will protect himself. The prevention of small-pox is impeded by illogical thought and statement of this sort, and appeals founded on one's duty to one's neighbour, such as the advice that vaccination is necessary "not only for his own safety but for that of others," are not likely to be of much value. I would suggest that the public health authority should replace the board of guardians in executive control of small-pox prevention, and that it should be part of the duty of that authority to undertake the education of the people. The lines which this education should take and the methods of carrying it out will suggest themselves.

Compulsion in its Relation to Vaccinia and Small-pox.

The making of a law entails the prescription of penalties for its infringement. The removal of the penalty destroys the effective administration of the law. Within the last two decades, the removal of the penalty for the neglect of the law that infants must be vaccinated has gone far towards making vaccination law ineffective in this country. It is possible to re-enact the law. But would the re-enactment, taking into account the massive opposition which would be raised, justify itself by enabling us to attain our object, the prevention of small-pox? At the present time protection is afforded to 38 per cent. of children. There must be, and in fact there are, large sections of the community where the percentage of protection is much lower. One is not very hopeful of the result of an attempt to enforce the vaccination of infants in these districts. Let us consider the conditions which have to be met. Compulsion in any form is repugnant to us. To be tolerated it must make a valid appeal to reason. Having for four years fought against a system of government of which the basis and fabric were compulsion, it is not difficult for us to understand the attitude of the parent towards the compulsory vaccination of infants and children of tender age when we realise that he may never have heard of a case of small-pox or of fatal small-pox in his neighbourhood, and therefore has no experience of the results which may follow an attack. For example, suppose that a man were to receive at the present time a Government form instructing him that he is required to arrange for an efficient shelter for his children in the event of an air raid, that he will be penalised if he fails to do so within a stated period, and that he must supply documentary evidence that he has carried out the order. One can imagine his attitude. Compul-

sory vaccination of infants, in the absence of small-pox or of fatal or disfiguring small-pox, makes the same sort of appeal. It is a bureaucratic order which may lose its appeal to reason on account of existing conditions and of ignorance. Again, from the parent's point of view, the immediate and local effects of the inoculation are apt to be detrimental to the present well-being of the infant. In spite of our assurance that these effects are strictly transient, they appeal to the parental feeling and become especially undesirable when they cause disturbance of the father's or mother's rest. The appearance of signs of constitutional feebleness or disease is apt to coincide with, or to follow soon after, the transient effects of the inoculation. One meets at times with families in whom, for reasons such as these, the eldest child is the only one who has been protected.

Responsibility of the Parent.

To return to the illustration. Let us suppose that the father is informed that it is his duty to arrange for an efficient shelter for his children in the event of an air raid, because he is the responsible protector of his family, and that he will be penalised in the event of injury to any of his children in an air raid if he has neglected to take the precaution advised. Such an order would, I believe, appeal to his reason because he would recognise his responsibility. Prosecution now follows any gross neglect of children which causes them to suffer in their health or well-being, But it is necessary to prove the suffering and the neglect before a penalty is imposed. Why should the parent or guardian whose child contracts small-pox not be compelled to justify his action in a court of law if he has neglected to afford his child the only protection against the disease? or if he has neglected to take his precautions until he is too late to ensure complete protection? Why should he not be liable to serious indictment if neglect is proved and small-pox has been the direct or a contributory cause of his child's death? In a manifesto issued before the recent election, it is stated: "When Labour rules, it will take care that little children shall not needlessly die." The death of a child from small-pox is the most needless of deaths because the disease can certainly be prevented. I confess that I should like to see the penalty attached, not to the neglect of the vaccination of infants, but to the evil result which may follow that neglect. It is more logical and therefore easier to deal with actual than with potential crime.

Even if the attempt to reinstate the compulsory vaccination of infants was completely successful, this measure is not sufficient in itself to enable us to attain our object, the prevention of small-pox. The immunity produced by the operation gradually, and in most cases completely, disappears and must be reproduced. The most important potential carrier of small-pox is the adult and, I believe, particularly the male adult, who daily leaves and returns to the family circle. The majority of the mothers and infants and children under school age are naturally screened from attack by the restriction of movement associated with family life. The unprotected or partially protected father and older children who go to work bring the disease inside the screen. During the war a large proportion of these potential carriers of small-pox were rendered insusceptible by vaccination and revaccination. But we are now beginning to reap the fruits of our legislative destruction of the protection of children against small-pox, because as time goes on more and more of these unprotected children go out to work and join the ranks of potential carriers of the disease, and as a result small-pox appears to be gradually but surely re-establishing its former position in this country as an endemic disease, and a disease of childhood and early adult life.

Suggested Method of Ensuring Vaccination of Children.

I would suggest (*a*) that the first offer of protection should be made by the Registrar of Births and by domiciliary visit of the public vaccinator; (*b*) that examination and record of the vaccinal condition of the school-children should be part of the duty of the school medical service, and the information thus obtained made available for the use of the vaccination authority; (*c*) that protection should again be offered to the unprotected when the child enters school; (*d*) that protection in the case of unvaccinated children should be compulsory at the seventh year of age, and that exemption of this class should be granted only on production of a medical certificate that the child is physically unfit for inoculation; (*e*) that vaccination and revaccination of those previously protected should be enforced under penalty for refusal during the last year of school life under the same condition for exemption, and that insusceptibility at this period should not be certified until three unsuccessful attempts have been made to obtain a reaction.

If we genuinely desire to rid ourselves of the menace of small-pox, the necessity for compulsory protection at some period of life must be acknowledged. There are good reasons for removing compulsion from the period of infancy, and for using it at the later periods. Parental objections have lost much of their power when the child has reached the seventh year, and a rigid compulsion at the time when the youth is about to leave the security of family life, and if incompletely protected to become a potential carrier of small-pox, has an obvious preventive value. After school age compulsion should be applied in the case of all immigrants, and of all who have been in contact with the disease.

If our vaccination laws were so framed as to make a greater appeal to reason than they do now, and if protection were strictly enforced at the later ages, I do not say that small-pox would disappear from the country, but I believe that the percentage of children protected in infancy and early childhood would increase and that in the course of a few years we might expect to be free from the menace of endemic small-pox, and from the risk of widespread epidemic disease which now constantly threatens us.

Prevention of Spread of Disease is not Prevention of Disease.

The method employed in this country in dealing with small-pox is not prevention. It may be called the preventive treatment of small-pox. The method finds its legal sanction in the sections of the Public Health law which deal with infectious diseases. These sections are sometimes described as preventive, but they do not merit the title. They provide, it is true, for the efficient notification and isolation of cases of small-pox, for the destruction of infection, and to some extent for the supervision of those who have been in contact with the disease. But they become operative only after invasion by the disease has occurred, and their object is not the prevention of disease but only the prevention of the spread of disease. Our Public Health law has no dealings with prophylaxis, and the assumption which underlies its provisions is that these provisions are in themselves sufficient to attain their object—namely, the prevention of an epidemic of small-pox in a community which is completely unprotected against the disease. Until quite recent times our method of preventive treatment has met with considerable success in controlling the spread of the infection. The machinery of the method, notification, isolation, and disinfection, has been gradually tuned until it has apparently reached the greatest perfection of which it is capable. The measure of success which has been attained has brought with it the disadvantage that the observation and study of the disease have become more and more nearly the perquisite of a few members of our profession. Perhaps also as a result of the measure of success which has been attained and maintained until recent times, an unfortunate tendency seems to have arisen to express a complacent but unjustifiable satisfaction with the method, a tendency to regard vaccination and to speak of it as if it were only one means among others of preventing small-pox and of keeping the disease under effective control, and not really the only

means which is of any permanent value. It is, I believe, quite certain that our administrative method has attained its measure of success simply because it has enjoyed the essential but unobtrusive support of prophylactic vaccination, and if one may judge from present experience in several parts of the provinces the inability of the provisions of the Public Health law to control the movements of small-pox, when this essential support is undermined, is being very clearly demonstrated. One may assume that vaccination is being used in these districts to the fullest extent to which persuasion can carry it, but it has to be acknowledged that there is no provision in the existing law for the use of vaccinia in the control of an outbreak of small-pox. It is reasonable to suggest that the measure which is the only really effective means by which the law can attain its object, the prevention of epidemic small-pox, should receive legal sanction, and be embodied in the law in order that it shall be the duty of the public health authority to provide for and enforce vaccination on all who have been, in the opinion of the medical officer of health, in contact with the disease, and that a penalty shall fall on any authority or "contact" who knowingly evades the obligation or causes unnecessary delay in carrying it out.

However keenly we tune the machinery of our method, the method will at its best remain palliative. The neglect of prophylaxis and the freedom of choice given to the "contact" and to the vaccination authority, will maintain our risk of epidemic spread of the disease, and the enormous expenditure required in preparation to meet that risk, and so long as we continue to neglect prophylaxis, no improvement in administrative procedure can lighten the excessive responsibility now placed on the practitioner who must retain the supremely important duty of setting the machinery in motion. The personal question, "Can this patient's condition, at present obscure, be the result of the infection of small-pox?" has become under existing conditions in this country more vitally important than it has been in the past, and the failure to ask it, or delay in replying to it, is much more apt now than it has ever been in our time to give the disease the opportunity for which it is always ready.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

The Ultimate Sequelæ of Infantile Cardiac Disease.

AT a recent meeting of the College of Viennese Doctors, which takes place weekly for the discussion of pathological problems, Docent Dr. Moll and Dr. Hecht discussed the late results of heart disease acquired in childhood. This chapter of pathology has hitherto received but scant attention from students. The Vienna children's clinic has instituted a regular control of cases that have been under treatment for a prolonged period, and these patients are invited to present themselves every other year for re-examination. Recently 42 former patients who had been treated for rheumatic endocarditis responded to the invitation. In 25 per cent. no trace of the affection was found, whilst 75 per cent. had signs of the disease. Cases which had left the hospital with symptoms of mitral incompetence now showed signs of mitral stenosis in addition. Furthermore, 21 cases of chorea minor or major, with concomitant valvular disease, came up for re-inspection, and in them the heart affection was still evident. Of nine cases of diphtheria, who suffered from cardiac trouble at the time of their dismissal from hospital, in three the heart proved normal on examination, whilst of six scarlet fever cases the heart was affected in two instances only, the other four being normal. All these control cases were seen seven to eight years after having left the clinic. In the opinion of the referees it is of importance in the after treatment to keep the patient in bed until the pulse-rate remains below 100, even after moderate exertion. As regards arrhythmia in children, in the majority of cases this symptom is due to respiratory influences unless an organic cause is present. The differential diagnosis of the former condition may be made from the fact that inspiration causes an increase of the heart beats, and expiration a decrease. Pathological arrhythmia is more frequent at the age of puberty. After infectious diseases, and also in cases of chronic constipation, one frequently finds in children a change in the pulse-rate, mostly of the type of extrasystole. A continuous arrhythmia (frequent in adults at the late stages of cardiac disease) is hardly ever encountered in children. As a rule all these cases clear up without delay. A diagnosis of organic cardiac disease in a child is not justified after a single examination, as other factors which emerge only after repeated examinations at varying intervals, such as accidental murmurs and variations of inspiration type, must be taken into consideration.

The Pathology of Goitre in Adolescents.

Dr. Gold, aided by Dr. Orator, read before the Medical Society of Vienna an instructive paper on the pathology of goitre in juveniles, based chiefly on anatomical investigations in 555 cases within the last two and a half years. Up to the seventeenth year the diffuse colloid goitre is more prevalent than the diffuse hypertrophic type. In older juveniles (19–21) the quiescent diffuse or the nodular type is more frequent. Girls reach the final stage of any particular type of goitre a few years earlier than boys, which seems to point to an endogenous factor (puberty?) in the genesis of the disease. Menstruation plays an important part in the rate and type of thyroid enlargement. Treatment by iodine seems to favour the formation of colloid goitre, as has been noted also in Eiselsberg's clinic. The anatomical structure of the juvenile goitre is a typical diffuse parenchymatous hypertrophy, with distinct formation of lobuli. Colloid material is present in small quantity only if no iodine treatment has been given. The iodine content of the examined thyroid gland is normal as a rule, the pharmacodynamic function is mostly normal or subnormal. Whilst in the juvenile goitre the number of follicles in the gland are increased and the epithelium is of one layer only, in the Basedow's (Graves's) disease the follicles are enlarged, but not increased in number, and the epithelium consists of several layers. Juvenile goitre does not represent a persistence of a previous stage of development, but is a compensatory hypertrophy due to previous hypofunction, and iodine treatment is justified. In cases of hypoplasia iodothyrin is required. Operation is advisable only when mechanical interference—e.g., pressure symptoms—becomes evident.

Venereal Diseases amongst Children under Welfare Care.

In a recent report of the Board of Guardians to the Municipal Council for Health, Prof. Tandler pointed out that venereal diseases were by no means rare in the children under the care of the Municipal Board for Juveniles. This office was organised some two or three years ago to look after the interests of children living in Vienna, from infancy up to the age of 18 years (apprentices and minors in industrial enterprises). School-children (aged 6 to 14), however, form the chief care of the board, including all orphans, waifs and strays, and other neglected children. In a central children's institute ("Central-Kinderheim") are housed all cases which cannot be looked after by friends or foster-parents, as well as weakly children not requiring hospital accommodation. Among the inmates of the institute no less than 150 have been found to be suffering from some form or another of venereal disease; acute or chronic gonorrhœal infection both in girls and boys is prevalent, but congenital syphilis is also fairly frequently found, whilst three cases of primary syphilis transmitted by careless friends or parents have occurred

only quite recently. A special pavilion, capable of accommodating 250 cases, will be devoted to the care of these children. This number will soon be reached, if the appropriate cases from the other institutes are also handed over to the venereal pavilion. It is intended to keep the children who are suffering from that intractable form of chronic gonorrhœal infection well known to all practitioners as a crux medicorum (and this condition is mainly found in girls of 3 to 12 years of age) separated from the other inmates for a prolonged period. A number of teachers and nurses will be employed exclusively in this pavilion, so that the children will not mix with the other inmates, whilst they can follow up the regular school teaching. Thus real isolation will be attained and spread of infection prevented.

Conflict between the Hospital Staff and the Nursing Staff in the Matter of Treating Abortion.

The controversy between the medical profession and the law over the right to induce abortion, which has been mentioned in a previous letter, has given rise to a noteworthy incident in one of our general hospitals. As a rule, the nursing staff in all public hospitals in Vienna consists of Catholic nuns. In the last few weeks the nuns doing service in the surgical department of this hospital refused to give assistance at any operations in the nature of abortion. It must be pointed out that combined surgical and gynæcological wards are common in our outlying hospitals. The nuns in this case obeyed orders given by their matron, herself a Catholic nun, who no doubt acted under instruction from high quarters as a protest against modern ideas of eugenics and against restriction of birth from considerations of economics and morals. When the nuns refused to do their duty at gynæcological operations of this type, the medical staff organised a subsidiary service, whilst a complaint was lodged with the Ministry for Public Health as superintending authority against the nursing staff. A speedy remedy of the grievance was expected; instead, the Ministry decided that in future gynæcological surgery should not form part of the regular work of the surgical department of this particular hospital! Naturally the medical staff will not accept this ruling. Energetic measures are in preparation, and the coöperation of the profession will be obtained by the aid of the Union of Economic Organisation in order to bring about such a solution as will be acceptable to the medical staff of the hospital.

SCOTLAND.

(FROM OUR OWN CORRESPONDENTS.)

Glasgow Royal Mental Hospital.

THE annual report of the physician-superintendent of the Glasgow Royal Mental Hospital—an advance copy of which reaches us through the courtesy of Dr. D. K. Henderson—contains many statements of interest. In the first place, the statistics of admissions and discharges are noteworthy. Of 120 discharges, 39 recovered, 27 were greatly relieved, and 13 were not improved. A complete recovery-rate of 32·5 per cent., as Dr. Henderson points out, is a satisfactory answer to the firmly rooted belief that "no one is ever likely to get better in a mental hospital." Of 120 admissions, 116 were private cases, and of these 53 were admitted as voluntary cases. Dr. Henderson stresses the great importance to be laid upon the recognition by the patient that he is mentally ill, and his subsequent coöperation in treatment, whether this be in an institution or not. That treatment can be successfully carried out without recourse to the mental hospital is reflected in the statement that in a little over a year, while 80 patients applied for advice at the out-patient psychiatric department of the Western Infirmary—where Dr. Henderson is in charge—in only two cases was it necessary to advise treatment in an institution. Public recognition of the value of prophylactic measures of this nature must show itself in the course of time both in the admission and recovery-rates recorded by institutions in centres where they are practised. A complete consulting staff has been appointed to the Hospital, and it is hoped that with their aid the interrelation between physical and mental illness may be more thoroughly investigated. During the year observations have been made upon the blood-sugar content, particularly in states of anxiety and depression; an attempt has been made to treat possible intestinal infection with bacillus acidophilus milk; and histological studies of cases of dementia præcox have also been carried out.

Occupational Therapy in Early Mental Disorder.—In recent years, the revival of occupational therapy as an aid to the treatment of early mental disorder has attracted a good deal of attention; and a considerable part of Dr. Henderson's report is devoted to this aspect of institutional life. In such a hospital as the Glasgow Royal Mental Hospital the majority of the patients are drawn from the professional and business classes. From both a physical and psychical point of view routine work is unsuitable for these patients. What is required is a task, suitably interesting and æsthetic for people of culture, and, moreover, so planned that it is capable of fulfilment by the particular patient. The confidence engendered and restored by a course of such occupational therapy is often of striking service in enabling the patient to make the mental readjustment necessary for his cure. Bearing this in mind, the Glasgow Royal Mental Hospital is to be congratulated on being "the first mental hospital in the British Isles to appoint a full-time occupational teacher, and to provide a separate occupational pavilion for the development of this type of therapy." Dr. Henderson concludes by making an appeal for a "well-educated, intelligent, refined type of girl" to take up mental nursing, which, as he points out, is a far more specialised calling than is generally supposed.

The Morison Lectures.

In his third lecture Dr. John Thomson dealt with the treatment of the mentally defective infant. The mainstay of this treatment is training, the burden of which falls on the mother, and it is the part of the medical man to instruct her. Dr. Thomson considers that it is usually best to reveal as little as possible to her of the true state of affairs, in view of the fact that many of these children die early from complications. The mother may in this way be spared much unnecessary distress. All that is usually required is to tell her that the baby is unable to do certain things that other babies can, and that with time and careful training he may be much improved. Constant repetition is necessary, and for this purpose the services of a tactful and sympathetic visitor are invaluable. To begin with, the mother must notice what things her baby is not doing as the normal baby should, and try to teach him to do them better one by one. He should be especially encouraged in anything he finds a little difficult, as any success he has will give him special pleasure, and so lead to confidence and encourage to further effort. As he grows older the mother must be careful never to do anything for him that he has learnt to do himself. She must be warned to watch for and check any bad habits the baby may develop, his attention, if possible, being drawn to something else. If he is slow in learning to speak, he should be constantly spoken to, even though he appears to be unheeding. She must attempt to develop character by increasing his self-control and independence. Affection for human beings or even animals and dolls is efficacious and should be encouraged. The emptying of the bladder and bowel in mentally defective children, as in young babies, generally takes place at regular intervals. The mother must try to find out the length of these intervals in her child's case, and lift him at the right times, so as to form a good habit.

The effect of this on character and happiness is very striking. Chewing of solid food may have to be taught. Open air is often beneficial in cases of constant, apparently causeless crying. In spastic diplegia special exercise should be used to help and encourage the child to gain more control over the stiff limbs. Passive and active movement should be employed. As the child gains more control simple games should be devised to induce him to use his limbs more freely. Dr. Thomson regards surgical interference as of occasional value in these cases.

Measles in Scotland.

The Scottish Board of Health has issued a circular to the local authorities announcing that, with the consent of the Government, a sum of £10,000 has been added to the maternity and child welfare grant, to be set aside for the treatment and control of measles. Recognising the very high death-rate from measles in children under 5 years—and a considerable proportion of these deaths occurs in infants under 1 year—while after the age of 5 years measles becomes much less dangerous, the Board considers that the problem is, perhaps, not so much the prevention of the occurrence of measles in the child as the postponement of it to the later years of childhood. Local authorities are invited to submit proposals for the further provision against measles, which might run on the following broad lines set out by the Board: (*a*) Notification of the disease; (*b*) appointment of a special ad hoc staff of visiting nurses for infectious diseases; (*c*) increased hospital facilities; (*d*) an increased service of health visitors. The scope of these preventive measures may also be extended to include whooping-cough.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Dangers of Swimming Pools.

MANY cases of spirochætosis hæmorrhagica have recently been reported in individuals habitually frequenting the swimming pools which have of recent times been established in the poorer quarters of Paris. No other source of contamination having been discovered, it is thought that the infection must have arisen through the insanitary condition of these pools, and the Société de Médecine de Paris has passed the following resolution: "That this society, prompted by the recent outbreak of spirochætosis hæmorrhagica contracted in a Parisian swimming pool, coming after numerous cases reported of conjunctivitis, suggests that swimming pools of the city of Paris should be better supervised; that their water should be changed more often, and, above all, that bathers should not be allowed to go into the water except after thorough washing of the whole body with soap and tepid water."

Spread of Malta Fever by Goats.

Every Parisian remembers from childhood the pleasant sight of the itinerant goatherds, in the quieter quarters of the city, leading their little flocks of five to ten goats to the sound of a rustic flute. These were the vendors of goats' milk, and they brought something of the Mediterranean sunshine into the streets of Paris. A customer would bring a bowl, which the flute-player would fill with warm milk drawn there and then from one of his herd. Unfortunately, it has been found that this milk was dangerous. Several cases of Malta fever (*Micrococcus melitensis*) were notified in Paris, and investigation showed that children were infected by the milk of these itinerant vendors. In consequence, an order has been issued prohibiting the sale of milk from such sources in the public streets, and the Council of Public Health of the Department of the Seine, under the presidency of Prof. H. Vincent, has enacted the following measures: (1) veterinary inspection of goats; (2) control of itinerant goats'-milk vendors in the Department of the Seine. Goats which come from contaminated districts must not be allowed on the streets. Only thus can protection be ensured from a disease whose spread would be a great danger in the north of France.

An Epidemic of Donors.

A curious epidemic of people desiring to give blood for transfusion has been reported by two doctors from l'Hôpital Lariboisière to the Academy of Medicine. Three people came to the hospital in one week offering their blood for various purposes. The first was a young man of 22 who asked that his blood might be used for transfusion into that of any patient seriously ill. Next, a woman aged 35 desired to make an important communication to the chief medical officer, the communication being the expression of a wish to give her entire blood to a sick person in order that she might be of some use before dying. The third applicant was a young man who found his way to a ward and declared to the nterne who received him his desire to lend himself for the performance of some experiment for the advance of medical science which would involve bleeding him to death. The explanation why in the Lariboisière quarter alone so many people should desire to sacrifice themselves in this special way is explained by the fact that in a cinema near the hospital a film has been shown wherein the heroine offered transfusion of her blood in dramatic circumstances.

ROYAL MEDICAL BENEVOLENT FUND GUILD.

THE fourteenth annual general meeting was held at 11, Chandos-street, Cavendish-square, London, W., on March 12th, Lady (Rose) Bradford presiding.

Lady Fripp, chairman of the Council, read the report of the Council for 1923, which recorded increased support of the Guild by members of the profession and their friends. The festival dinner held in February, 1923, gave a great impetus to the work and its effects have been far-reaching. The sum directly realised was £1336 and, moreover, as a result of the scholarship scheme advocated by Sir Douglas Hogg in his speech, two new scholarships have been founded, one by the Manchester branch, and the other by Mr. Noel Wills, in memory of his mother. In each case the sum given was £250, which sum invested yields £30 annually for ten years. The St. Pancras branch had been resuscitated, and a North London section of the Guild had been inaugurated. Bournemouth had trebled its subscription, and Cardiff and Glasgow had sent most encouraging statements of increased contributions. Edinburgh, Peebleshire, Hampstead, Kennington, and Westminster had also made extra efforts. The Ladies' Medical Golfing Society competition brought in over £150, and the amount had been invested to found a scholarship of £30 for five years.

Mrs. Scharlieb, M.D., hon. treasurer, submitted the financial statement. The annual subscriptions in 1923 amounted to £1224, an increase of £120. Donations, under which heading were included the results of special efforts made on behalf of education, amounted to £3080, being £1925 more than in 1922. The total receipts for the year amounted to £4704; of this sum £900 had been devoted to the purchase of scholarship annuities; £2402 had been spent directly upon the Guild beneficiaries (£872 being for education); £1000 had been invested in War Loan, and the balance brought forward, after meeting general expenses, was £391.

Mrs. Arthur Ormond read the report of the Visiting and Case Committee. During 1923 the Committee had apportioned £766 in monthly grants, the recipients numbering 52. This was an increase of £138 over the amount spent in 1922, and more than £300 above that spent in 1921. Acute poverty, old

age, illness, and other causes resulting in inability to work formed the main reason for these grants. In addition, 54 applicants received special gifts of money during the year amounting to £312 in all, for sudden emergencies, such as sanatorium fees, special medical treatment, maintenance while waiting for a post, removal expenses, remedial exercises, fares, outfits, arrears of rent, and so forth. Spectacles had been supplied to three beneficiaries, and eight had had dental costs paid for them. £65 had been distributed in coal grants amongst 63 applicants. Holidays had been secured for 18 persons, and this was recognised increasingly as an extremely valuable part of the Guild's work. The Committee thanked those who had sent Surgical Aid letters and appealed earnestly for more of these, also for Royal United Kingdom Beneficent Association votes. The educational branch was a source both of anxiety and pride. The responsibilities of this work were shouldered almost entirely by the Guild, since all appeals made to the Royal Medical Benevolent Fund are referred to the Guild. The anxiety arose from the increasing number of applications for assistance as this enterprise of the Guild became more generally known. £872 had been spent on education and training during 1923, against about £700 in the previous year. Training had been given for most varied careers, for example, secretarial work, partial fees for a lady dentist, fashion artist, teacher of physical exercises, cookery, &c., and maintenance was paid in several cases where no money was available for food and housing during training. Mrs. Ormond described in detail the pitiable condition of various recipients of help from the Guild, and made it clear that the constructive policy of the Guild was to assist to earn, to educate to earn, and to induce self-reliance. Herein lay the explanation of the widening of its self-imposed responsibilities in undertaking educational and training schemes. It was satisfactory to note that there had been no instances during the past year of any beneficiary losing through his own fault a berth obtained for him. School reports and reports of careers subsequent to school life had been gratifying. It must not, however, be forgotten that the work could only be carried on if the medical profession maintained the inflow of money.

In the absence of Miss Swinford Edwards, the report of the Father Christmas branch was read by Lady Fripp, who also read a report of the Clothes Committee.

Lady Lewis moved, and Mrs. Laming Evans seconded, the re-election of Lady Bradford as president, Lady Fripp as chairman of the Council, and Mrs. Scharlieb as hon. treasurer. Mrs. Woodwark moved, and Miss Jenkyn Brown seconded, the resolution that Mrs. Barrett, Lady Lewis, and Mrs. Liveing be elected members of the General Purposes Committee. These motions were agreed to, and a vote of thanks to the President and Council, proposed by Mrs. Wilfred Harris, was carried with acclamation.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. R. B. Ainsworth to be Lt.-Col.

Capt. J. H. C. Walker to be temp. Maj. whilst empld. as a Dep. Asst. Dir. of Pathology.

MILITIA.

Capt. W. A. Miller to be Maj.

TERRITORIAL ARMY.

Lt. R. Morris (late Lan. Fus.) to be Lt. for service with Leys School Contingent, Jun. Div., O.T.C.

Lt. P. Mumford to be Lt.

General Hospitals: Lt.-Col. A. L. Flemming, having attained the age limit, is ret., and retains the rank of Lt.-Col.

Capt. A. C. Court to be Maj. (Prov.).

Capt. C. B. Moss-Blundell having attained the age limit is retd. and retains the rank of Capt.

Capt. A. N. Smith (late R.A.M.C., S.R.) to be Capt.

Correspondence.

"Audi alteram partem."

THE RISKS OF CERTIFYING IN LUNACY: INDEMNITY INSURANCE.

To the Editor of THE LANCET.

SIR,—With reference to the leading article on the case of Harnett *v.* Bond and Adam, published in your issue of March 8th, there can be no doubt as to the serious effect the decision of the courts in this case will have on the minds of all members of the medical profession—not only on those members of that profession who specialise in mental cases. The decision, however, only serves to emphasise the very grave risks to which all persons who are engaged in a professional capacity are daily subjected in carrying out their duties towards their patients or clients, notwithstanding how skilfully or carefully such duties may be exercised. The decision also serves to emphasise very strongly the fact that doctors, surgeons, and other medical practitioners should seriously consider the advisability of protecting themselves individually, by means of insurance, against possible claims for damages, in the same way as other classes of professional men have deemed it essential to do for a considerable time past.

Accountants, solicitors, directors of public companies, and other classes of professional men consider it money well spent to arrange insurance indemnities so that they may carry on their profession untrammelled by the ever-present risk of finding themselves ruined financially from the action of some ungrateful or spiteful client; for it must not be forgotten that, even though an action for damages may fail, the cost of defending such an action is heavy and often beyond the means of the unfortunate victim, the professional man.

This subject of professional indemnity insurance is one which has not received, hitherto, the publicity and attention which it deserves. The facilities which are available to accountants, solicitors, and others are equally available to members of the medical profession—at a very low cost—and with the remedy in their own hands, it would seem that the medical profession have not much need to fear the effect of the decision in the Harnett case.

We are, Sir, yours faithfully,

SANDERSON AND CO.,
Insurance Brokers.

91–93, Bishopsgate, London, E.C., March 7th, 1924.

*** The measure of the protection offered to medical men by their own admirable defence societies is indicated in their annual reports. The extent of the cover afforded to members of the Medical Defence Union against damages and costs of the other side in the event of an adverse verdict is now £3000, in any case which is undertaken on behalf of the member by the Council of the Union, and it must not be forgotten that a member of the Union is provided with his legal defence entirely free of cost to himself in addition to the indemnity insurance. The London and Counties Medical Protection Society undertakes to grant a similar indemnity to its members. In view of recent events it is probable that the Councils of the two Societies will consider carefully the question of extending the benefits of their present indemnity insurance. No doubt it is possible to insure against any risk by paying the necessary premium, but it seems unlikely that any insurance brokers could afford to insure individual members of the profession to the same extent as the cover provided by the defence unions, except upon a greatly enhanced premium. In giving protection at the rate of £1 to cover an insurance of £3000, the defence societies retain the power to refuse to indemnify at the discretion of the Council. Without this power of refusal the insuring society or company might be ruined by

insuring some disreputable individual. On the other hand, the Council of a medical protection society, if it did not do justice to a member, could be turned out forthwith. Since an insurance company is not subject to any such discretion the precise conditions have to be set forth minutely when the insurance might fail at a critical point.—ED. L.

CERTIFICATES OF INSANITY.

To the Editor of THE LANCET.

SIR,—It is not quite clear what Dr. H. Rayner[1] desires; he appears to object to the responsibility attaching to certification, but could this be diminished or could the duty be performed by non-medical citizens? The risk indeed is small to a man who appreciates what he is doing, and who acts with commensurate care, while the responsibility for ordering detention actually does rest with the legal authorities. All that is required of the medical "witness" is definite, verified, or referenced evidence sufficient to enable this authority to form his own opinion. If only vague, "scrappy," technical *evidence* is offered, this will throw a greater moral onus upon the medical *opinion* "that the patient should be detained."

The very gravity of the charges that have to be made against a medical man for wrongly certifying (in order to constitute an actionable complaint) shows how well the profession is protected from frivolous recriminations. If the practitioner desires further security, he need not certify; or he could safeguard himself to some extent by refusing to accept a fee. Further legal immunity—security for the profession—could probably only be obtained at the expense of public security (from unconscientious certification), and even if we desired and could obtain this it would only aggravate the public suspicion, which is our real grievance.

It is quite true that the community demands full protection from insane conduct and then "salves its conscience" by reviling and penalising its obedient protectors, but psychiatry is not the only sufferer from this. The most it justifies us in demanding is a more definite and explicit statement of the principles upon which the community sanctions interference with personal liberty. It cannot be denied, moreover, that our own advocacy of compulsory detention for *curative purposes* as distinct from *security* has added to the prevailing uncertainty as to the grounds upon which detention is recommended and sanctioned.

Dr. Rayner's contention that "a non-official general practitioner is not the servant of the legislature, and should therefore not be required to take any responsible part in carrying out its objects," appears to me inadmissible and dangerous doctrine, as also does his demand that medical certificates of insanity should be secret and "privileged" documents. These form an essential part of the procedure for restricting the liberty of a fellow-citizen, and must stand public scrutiny. British law does not act on secret and *non-responsible* evidence.

Corporate action by the profession on the lines he advocates, and at the present moment (with a Government inquiry pending) appears to me very undesirable, especially action that appears designed to "force the hand" of the legislature. The only real and satisfactory security we can have is the confidence of the public. Vindictive and unreasonable action on their part is symptomatic of suspicion and a feeling that safeguards and supervision are insufficient. We have nothing to lose by any measures of security it may please to take; we have everything to gain by an overhauling of the Lunacy Law with which the profession has never been content. This overhaul has been promised, and surely our business is rather to prepare our case than to prejudice it by partisan action.

I am, Sir, yours faithfully,

Perth, March 15th, 1924. I. D. SUTTIE, M.B.

[1] THE LANCET, March 15th, p. 570.

To the Editor of THE LANCET.

SIR,—Dr. Rayner's suggestion for the protection of medical practitioners through the wiping out of every trace of the evidence given by them for committal to an asylum would, I fear, be likely to lead to a reaction in the direction of providing more safeguards for the individual concerned. It would also incidentally abolish Section 82 of the Lunacy Act.

The question of a doctor's liability in the matter of signing a certificate did not arise in the recent action of Harnett *v.* Bond and Adam. Certifying doctors are at the present moment amply protected by reason of the fact that in the eye of the law it is the reception order signed by the judicial authority, and not the medical certificate, which is the cause of the alleged lunatic's committal. The certifying doctor escapes liability on the ground that he is only a witness tendering evidence. In common with all other witnesses, the reliability of the doctor's evidence ought in fairness to be tested through cross-examination by the solicitor or friend of the alleged lunatic in the presence of the magistrate and of the individual himself. Should the latter desire it, the whole proceedings could be conducted in privacy. Doctors need not consequently be in any dread as to liability for damages arising out of bona fide certification, while their sworn evidence from the witness-box will be regarded as strictly privileged.

I am, Sir, yours faithfully,

S. E. WHITE, M.B., B.Sc.

Tower Hill, E., March 16th, 1924.

To the Editor of THE LANCET.

SIR,—I have read Dr. H. Rayner's letter in your issue of March 15th, in reply to which I think the point he raises is covered by the last paragraph of Section 330, Subsection 1, of the Lunacy Act, 1890, which reads as follows: "He (the doctor signing the medical certificate) shall not be liable to any civil or criminal proceedings whether on the ground of want of jurisdiction or any other ground *if such person has acted in good faith and with reasonable care.*"

I am, Sir, yours faithfully,

STANLEY A. GILL, M.D., &c.

Formby, Lancs, March 17th, 1924.

HARNETT *v.* BOND AND ADAM.

To the Editor of THE LANCET.

SIR,—In your leading article with reference to this case in your issue of March 8th, 1924, I note with satisfaction that you express yourself as "amazed and horrified" that the jury should have found that Dr. Bond was aware of the plaintiff's sanity at the time when he was taking measures to return him to Malling House, and in addition to which I believe he stated in his evidence that he considered him to be of unsound mind. You also draw attention to the fact that Justice Lush expressed himself surprised on learning that the patient is not personally made aware of the grounds of his detention, and, if I remember rightly, conveyed the impression that he considered the patient should be presented with a copy of his certificate. Personally, I have always treated these certificates as confidential documents, and I should be interested to know whether this is not the way that they are looked upon by every Medical Superintendent, and also whether this is not the attitude the Medical Profession would expect us to adopt?

I am, Sir, yours faithfully,

RICHARD EAGER, O.B.E., M.D.,
Medical Superintendent, Devon Mental Hospital, Exminster.

March 12th, 1924.

*** To a question asked in the House of Commons last week "Whether, in view of the verdict in Harnett *v.* Bond and Adam, the Minister of Health proposed to suspend Dr. Bond from acting as a Lunacy Commissioner pending the decision of the Court of Appeal," Mr. Wheatley replied in the negative. Mr. Wheatley called attention to the fact that a

discussion could not be entered into upon a case which is still *sub judice*, but he went on to say: "I would draw attention to the fact that Mr. Justice Lush stated that he agreed that there was no evidence of any dishonesty or *mala fides* on the part of Dr. Bond. In view of this fact, and of Dr. Bond's long and distinguished record of public service and his eminent position in the scientific world, I see no reason to take the action suggested." The answer was not given orally, which is to be regretted, as possibly supplementary questions would have made certain points clearer. With the learned judge's expression in court, after the verdict, we cordially agree.—ED. L.

MEMORIAL TO PROF. O'SULLIVAN.

To the Editor of THE LANCET.

SIR,—Two meetings of the late Prof. A. O'Sullivan's friends have been held in Trinity College, at which it was resolved to found a memorial to him in connexion with the Medical School in Trinity College, where he held for so long the chair of pathology. Any of your readers who may wish to take part in the project are asked to write to either of the undersigned, who will supply further information.

We are, Sir, yours faithfully,

E. J. GWYNN, } Honorary
JOSEPH W. BIGGER, } Secretaries.

Trinity College, Dublin, March 15th, 1924.

B. PYOCYANEUS INFECTION.

To the Editor of THE LANCET.

SIR,—The case of *B. pyocyaneus* infection reported by Dr. H. Ronald Carter in THE LANCET of March 1st is very interesting. Now and then one discovers this organism in various parts of the body, usually in association with other bacteria, and the question of vaccine treatment is raised. My object in writing this note is to draw attention to a method of treatment which Dr. Carter has not mentioned, and which I was taught some years ago—i.e., irrigation with 1/500 or 1/1000 biniodide of mercury. Since that time I have invariably advocated this method and it seems to work very well indeed. When there is an open wound or channel and irrigation can be carried out freely most of the cases have cleared up in a week or two. I have never used a vaccine but have always held one in reserve, and am grateful for the warning as to the severity of the reaction which may take place unless the dose given is very small. As Dr. Carter points out, the bacteriologist cannot always tell what the minimum dose in a particular case should be, and when a violent reaction does occur it is not easy to persuade the patient to continue with the treatment. An experience of mine has some bearing on this point. A short time ago the initial dose of an autogenous vaccine which I made for "colds" was followed by a general urticarial rash within 24 hours, and the patient was greatly alarmed. I felt sure it was not due to the character of the vaccine, and asked for its return with a view to investigation. I first injected some under my own skin and then inoculated some into various media. My skin showed a slight reaction —redness and swelling—and the tubes remained sterile. My relief can be imagined. I take it the urticaria was due either to an idiosyncrasy on the part of the patient, anaphylactic phenomenon, or to a coincidence. The patient has since received several doses of the same vaccine without any untoward symptoms.—I am, Sir, yours faithfully.

ERNEST H. SHAW.

Royal Northern Hospital, March 12th, 1924.

DONATIONS AND BEQUESTS.—By will the late Lieut.-Colonel John Ritchie, of Mossley Hill, Liverpool, left £500 to the Royal Southern Hospital, Liverpool, and £250 to the Liverpool Royal Infirmary; the Children's Infirmary, Liverpool; the David Lewis Northern Hospital, Liverpool; the Bootle Borough Hospital; and the Liverpool St. Paul's Eye and Ear Infirmary.

Obituary.

ROBERT ALEXANDER BICKERSTETH, F.R.C.S. ENG.

Mr. R. A. Bickersteth, honorary consulting surgeon to the Royal Infirmary, Liverpool, died at Bournemouth on March 6th in his sixty-second year.

A son of the late Mr. E. R. Bickersteth, F.R.C.S., Robert Bickersteth was educated at Eton and Trinity College, Cambridge, gaining the Natural Science Tripos in 1884 and his M.A. in 1887. He obtained his surgical experience at St. Bartholomew's Hospital, graduating M.B., Ch.B. in 1891, and in the same year he became a Fellow of the Royal College of Surgeons. He was appointed honorary surgeon at the Royal Infirmary, Liverpool, some 30 years ago, and later became lecturer and examiner in clinical surgery in the University of Liverpool. As a clinical teacher he appealed to the student by the practical usefulness of what he had to offer them; he laid stress on the importance of painstaking observation and on the maxim that more errors are due to want of care than to want of knowledge. When he relinquished the position of honorary surgeon at the infirmary in 1921, the committee of that institution elected him honorary consulting surgeon in recognition of the services which he and his family had rendered to the infirmary for three generations. He was a member of the Association Internationale d'Urologie and a corresponding member of the Association Française d'Urologie. His publications on urinary surgery, which appeared in THE LANCET and elsewhere, were much in advance of his time. Twenty years ago he perfected and described an intravesical arrangement for drawing off urine from either ureter separately, and he went on to catheterise the ureters and to deduce from the results the conservative surgery of the renal pelvis. His knowledge of morbid anatomy was sound, and he was apt to see with the naked eye what others required the microscope to discern.

We have received the following personal appreciation from "J. T. M.":—

"Of the late Mr. R. A. Bickersteth it is difficult to write in such a way as adequately to convey a picture of that gentle, kindly personality that won him so many friends. He was one of those men, gifted with a charm that could not fail to draw friendship, who through the shyness of his demeanour often left his quiet humour and his sense of the deep things of life unsuspected. A man of the highest ideals in his profession, he was a good friend to the Liverpool Medical Institution, to which he gave his library, comprising many rare and valuable volumes, on his retirement. Mr. Bickersteth took more than a passing interest in astronomy, and photography also claimed his attention. His great hobby, however, was shooting, and only rarely did a season pass without a visit to Scotland. During the war he served at home and for more than a year in No. 57 General Hospital in France, and there is no doubt that it was during that time that his health began to fail. It will be long before his fine presence and his kindly heart will be forgotten."

On March 5th a memorial service was held in the Chapel of the Royal Infirmary, where Mr. Bickersteth had spent many years of devoted service. The service was conducted by the Rev. Mr. Macdonald, chaplain to the hospital, and there was a large attendance of friends. Mr. Bickersteth is survived by a widow and several sons and daughters.

DONALD WILLIAM CHARLES HOOD, C.V.O., M.D. CAMB., F.R.C.P. LOND.

WE regret to announce the death of Dr. Donald Hood, consulting physician to the West London Hospital, which occurred on March 15th at his house in St. John's Wood, where he had gone to reside on retirement.

Donald William Charles Hood was born in 1847 at Market Lavington, the eldest son of Sir Charles

Hood a Lord Chancellor's Visitor in Lunacy. He was educated at Harrow and Gonville and Caius College, Cambridge, completing his medical education at Guy's Hospital. He graduated in medicine at Cambridge in 1871, proceeding eight years later to the M.D. degree and taking the Membership of the Royal College of Physicians of London in the same year, being later elected Fellow.

After holding appointments at Guy's Hospital, he was appointed assistant physician to the West London Hospital, and obtained excellent early introduction to private practice by close professional relations with Sir William Gull. He proved himself in public and private capacity a very able physician. He did excellent work in the early "nineties" in connexion with the treatment of rheumatism, publishing statistics with reference to the use of salicylates in acute cases which were recognised as of real practical value. He wrote critically also on the diagnosis and treatment of typhoid fever and on acute pneumonia, while a long line of residents at the West London Hospital could testify to his merits as a hospital physician and a clinical teacher. His professional position, although he was not on the staff of any teaching hospital, was recognised by his appointment as examining physician to the Foreign Office, and as an examiner of medicine in the University of Cambridge. He was decorated after the Boer War for services rendered in connexion with two great funds instituted for the relief of wounded and sick officers during that war, while he was also both a governor of Bethlem and Bridewell Royal Hospitals and a member of the board of management of Earlswood.

Dr. Hood married Alice, daughter of John Wickham Flower, by whom he had one son and three daughters.

THOMAS BRITTIN ARCHER, M.R.C.S. ENG.

THE late Mr. T. B. Archer, who died recently of angina pectoris in his seventy-ninth year, was the youngest child of Mr. Goodwyn Archer, of Ely, Cambridgeshire. Born in 1846, he was educated at the King's School in Ely and afterwards at the Grammar School at Ipswich. In 1865 he was apprenticed to Dr. Richard Jones, of Woodbridge, Suffolk, and completed his medical studies at St. Bartholomew's Hospital, obtaining the qualification of M.R.C.S. When the first ophthalmic ward of St. Bartholomew's Hospital was opened, Mr. Archer was appointed ophthalmic house surgeon in November, 1870, and served for a year. Subsequently he visited in rotation the principal ophthalmic hospitals in Brussels, Berlin, and Vienna for a period of nearly three years. On his return in 1873 he was appointed clinical assistant to the Central London Ophthalmic Hospital and the Royal London Ophthalmic Hospital, and became surgeon to the former hospital in the same year. He rose to the senior surgeoncy in 1879, and from that time as chairman of the medical committee did all in his power to increase the efficiency of the hospital both as regards its structure and personnel.

Retiring at the age limit of 65 in 1911 he became chairman of the hospital at the most critical period of its history when its funds were at low ebb and money had to be obtained to build a new institution, and it may be said that to his services the new hospital owes its existence.

On the outbreak of war he once more became an active member of the staff, helping daily to replace those members of the staff who had been called up on active service. In appreciation of his work the committee of management named one of the wards in the new hospital the "Archer Ward." In 1921 he resigned the chairmanship of the hospital and retired into private life. He was fond of music and painting, and in his youth was an expert with both rod and gun. Under a somewhat critical exterior he hid a generous, straightforward nature which endeared him to those who knew him well.

GEORGE PALMERSTON NEWBOLT, F.R.C.S. ENG.

THE sudden death of Mr. G. P. Newbolt, lecturer on clinical surgery at the University of Liverpool, on March 9th, in his sixty-second year, came as a great shock to the medical community in Liverpool, where Mr. Newbolt filled an important and an honoured place. He received his medical education at St. Bartholomew's Hospital, London, and at Durham University, graduating M.B. Durh. in 1884. The following year he obtained the M.R.C.S. Eng., followed in 1888 by the Fellowship. Later, in 1896, he became a Heath scholar of Durham University, where he worked for some time as assistant demonstrator in anatomy. After graduation he continued his training as a house surgeon at St. Bartholomew's, and on leaving London was appointed surgeon to a section of the Manchester Ship Canal. Here he came in touch with Sir Robert Jones, with whom he formed a life-long friendship. On the completion of work on the canal Mr. Newbolt became surgeon to the Liverpool Stanley Hospital till 1897, when he was elected to the staff of the Royal Southern Hospital, ultimately reaching the position of senior surgeon and dean on the retirement of Sir Robert Jones. Mr. Newbolt also held the appointment of honorary consulting surgeon to the Clerical Union, North-Western District, and of honorary surgeon to the Leasowe Hospital for Children. He published several interesting monographs on various aspects of surgery in the *Liverpool Medical Journal* and elsewhere.

During the war Mr. Newbolt did untiring work in connexion with the officers' hospital at Croxteth Hall and the Myrtle-street Auxiliary Hospital. He was at one time chairman of the Medical Faculty of the University, and recently was elected president of the Liverpool Medical Institution. Superficially he was not one to attract friendship, but his real worth became apparent on further acquaintance, and those who knew him best respected him most. He leaves a widow, a son, and three daughters.

HENRY HAMMOND SMITH, M.R.C.S. ENG.

Dr. H. H. Smith, surgeon to the Corbett Hospital, Stourbridge, died on March 4th at his home in Kensington at the age of 73. Born in 1851, he received his medical training at Middlesex Hospital, qualifying M.R.C.S. in 1872 and L.R.C.P. two years later. His work as a general practitioner gave him a first-hand knowledge of factory work and factory conditions, and when in 1901 a Royal Commission on Arsenical Poisoning was established, Dr. Smith's services were engaged to investigate the liability of articles of food and drink to be contaminated by arsenic. His inquiry was detailed and exhaustive and the results of his work are recorded in an appendix to the report of the Commission, which is still worth reading. He also carried out investigations on behalf of the Royal Commission on Tuberculosis during the years 1905 to 1907, when he did valuable work in connexion with swine tuberculosis and also in obtaining material for the Commission's inquiry into lupus. During the war Dr. Smith was appointed inspector of foods under the Local Government Board.

Yet with all his work he found time to devote to sport and country pursuits which he loved. He was a first-class shot, an excellent fisherman, and an authority on game birds. He was attached to the staff of the *Field*, to which journal he made many notable contributions, chiefly in connexion with animal pathology. In this connexion he conducted several investigations of great importance to sportsmen and contributed chapters to "The Grouse in Health and Disease" and "Tegetmeier on Pheasants." Dr. Smith was enthusiastic and indefatigable in everything which he undertook and he worked assiduously up to his death. His ability and charm of manner endeared him to all.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council on March 13th, Sir John Bland-Sutton, President, in the chair, licences to practise dentistry were conferred upon the following:—

A. V. Adams, Durham; F. E. H. Andersen and J. L. Anderson, Royal Dental; F. F. Anslow, London; A. R. H. Bennett, Guy's; C. V. Berry, Middlesex and Royal Dental; W. E. Berwick, C. E. Bowen, F. F. Brayfield, and W. E. Brigham, Guy's; H. A. Brown, J. N. Brummer, and W. A. Cannell, Royal Dental; L. M. Cartwright, Guy's; R. Chase, Royal Dental; J. W. Cooper, Bristol; W. M. Cowper, Royal Dental; F. H. R. Davey, Durham; F. G. Davies, Guy's; H. L. Davies, Royal Dental; E. Dixon, Leeds; H. M. Doubleday, Guy's; C. E. Down, Bristol; V. R. Estment, Guy's; H. B. Furniss, Leeds; G. V. Gibbs, Royal Dental; J. L. Gordon, London; G. L. Gould, Guy's; R. Hale, Royal Dental; D. S. Hammond-Williams, Guy's; M. W. Harvey, Royal Dental; R. M. Hastings, A. Hirschberg, and A. L. Hodgkinson, Guy's; H. Ihsan, Royal Dental; A. R. Jackson, Guy's; F. C. Jackson, Liverpool; H. H. Jager, Royal Dental; O. P. James, Guy's; H. P. Jeffery and A. J. Jordens, Royal Dental; L. S. J. Kanaar, Guy's; A. C. King, T. S. Latham, and R. R. Laver, Royal Dental; W. E. Leaver, E. R. Longhurst, and W. C. McGhee, London; P. J. Malone, Royal Dental; V. J. Matthews, Univ. Coll.; C. A. L. Meredith and D. G. Moffatt, Royal Dental; G. J. Moore, Birmingham; J. R. A. Moore, Guy's; E. W. G. Moran, Univ. Coll.; D. B. Muller, Royal Dental; V. W. Percival, R. G. Pengelly, and S. A. Pleasant, Guy's; Muriel Possener and W. E. Potter, Royal Dental; H. J. Ravenscroft, Leeds; J. F. S. Reynolds, Guy's; D. G. Ritchie, London; W. R. S. Robertson, Royal Dental; A. W. Shovelton, Birmingham; D. L. Simpson, Univ. Coll.; T. H. Smailes, Royal Dental; V. H. Tapp, Sheffield; F. R. Taylor, Guy's; G. Thom, Royal Dental; G. T. Thompson, Guy's; D. G. Thomson, Royal Dental; A. E. Tidd, J. B. F. Tunstall, L. P. Tupling, and A. E. J. Van Noorden, Guy's; G. Wasif and A. Wendel, Royal Dental; and F. S. S. Whiter, London.

Museum demonstrations will be given in the Theatre of the College in Lincoln's Inn-fields on Fridays and Mondays during March and April at 5 P.M., as follows: March 28th, Sir Arthur Keith, Specimens illustrating the Various Mal-developments of the Palate; 31st, Mr. C. E. Shattock, Lymphatic Glands; April 4th, Sir Arthur Keith, Development and Surgical Anatomy of the Nasal Air Sinuses; 7th, Mr. C. E. Shattock, Osteomyelitis; 11th, Sir Arthur Keith, Irregularities in the Growth of the Palate and of Eruption of the Teeth; 14th, Mr. C. E. Shattock, Tumours of the Colon. The demonstrations are open to advanced students and medical practitioners.

HUNTERIAN SOCIETY.—The third dinner meeting of the Hunterian Society will be held at Simpson's Restaurant, Cheapside, London, on March 24th, at 7.30 P.M. Dinner will be followed by a discussion on Rheumatics, which will be opened by Dr. F. J. Poynton.

CANCER HOSPITAL, LONDON.—The annual dinner of the hospital will take place at the Langham Hotel on Wednesday, April 2nd, at 7.45 P.M., with Mr. W. Ernest Miles in the chair. Tickets may be obtained on application to the Registrar, Cancer Hospital, S.W. 3.

ROYAL INSTITUTION OF GREAT BRITAIN.—The Friday evening discourse at 21, Albemarle-street, W., on March 28th, at 9 P.M., will be delivered by Prof. Hugh MacLean on Insulin. On March 27th, at 5.15 P.M., Mr. D. S. M. Watson will deliver the second of two lectures on Evolution To-day.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION: SPECIAL COURSES.—A two weeks' intensive course will be given at the London Temperance Hospital, Hampstead-road, from March 31st to April 12th. The course will include practical demonstrations each morning from 10.15 to 12.15, ward rounds and out-patient clinics in the afternoon from 2 to 4 P.M., and special demonstrations on Saturdays at Bethlem Royal Hospital and the Royal Westminster Ophthalmic Hospital. A clinical lecture will be given each day at 4.30 P.M. (to which members of the profession are invited), the first, on March 31st, by Sir Humphry Rolleston, being on the subject of Jaundice. Among other lecturers will be Mr. V. Zachary Cope, Mr. Ernest Clarke, Dr. Soltau Fenwick, and Mr. Ernest W. Miles. A three weeks' course on Ophthalmology will be given at the Royal Westminster Ophthalmic Hospital from March 31st to April 17th. In addition to clinical work each afternoon special demonstrations will be given twice a week on Medical Ophthalmology and Methods of Examination. Copies of the syllabus and further particulars will be forwarded on application to the Secretary to the Fellowship of Medicine, 1, Wimpole-street, W. 1.

NORTH-WESTERN TUBERCULOSIS SOCIETY.—A meeting of this society will be held at the X ray department of the Manchester Royal Infirmary on March 27th at 3.15 P.M., when Dr. A. E. Barclay will give a demonstration dealing with the differential diagnosis of tuberculosis.

MEDICAL OFFICERS OF SCHOOLS ASSOCIATION.—A general meeting of the Association will be held at 11, Chandos-street, London, W. 1, on April 9th at 5 P.M., when Mr. Ernest Clarke, F.R.C.S., will read a paper on the Care of the Sight of School-children.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN.—Scholarships of the total value of £1100 will be awarded in May and July of this year. Full information and forms of application can be obtained from the Warden and Secretary, 8, Hunter-street, London, W.C. 1.

OPHTHALMIC BENEFITS FOR INSURED PERSONS.—A group of ophthalmologists especially interested in this subject have formed themselves into a committee in order to support the British Medical Association in any action that may be taken to secure a working arrangement for the treatment of insured persons by duly qualified ophthalmic surgeons. "Optical benefit," as it is described in the insurance regulations, is dealt with in different ways by the various approved societies, but in only one society is any satisfactory arrangement made to provide for the insured the services of competent ophthalmic surgeons. This is unfair to insured persons and most serious for the future of ophthalmology in this country. A meeting to receive the report of the above committee and to consider their proposed programme will be held in the Council Chamber of the British Medical Association, 429, Strand, London, W.C., on March 27th, at 5.30 P.M. The support of ophthalmologists is requested, and any who desire to attend and would like to receive further particulars are asked to address their letters to the Ophthalmic Benefit Committee, 30, Finsbury-square, London, E.C. 2.

LONDON COUNTY COUNCIL AND DETENTION OF LUNATICS.—The Mental Hospitals Committee of the London County Council has prepared a lengthy report on the precautions and safeguards which exist to prevent detention of sane persons in the Council's mental hospitals. After reviewing in detail the existing procedure for admission, the Committee point out that the Council has made more than one endeavour to secure uniformity of practice, by seeking legislative authority for the establishment of receiving houses in London, to be administered by the Council, to which prospective parish cases could be admitted for observation, and where certification could be carried out by expert practitioners under uniform conditions. The legislation which the Council promoted never passed both Houses of Parliament. The Committee further explain that patients in county and borough mental hospitals enjoy a "material safeguard against improper detention," inasmuch as these institutions are managed by a committee appointed by the responsible public authority. The Subcommittees of the Mental Hospitals Committee meet fortnightly, and it is a statutory duty for at least two members together, once at least in every two months, to inspect every part of the hospital at which they serve, to see every patient, and afford full opportunity of complaint, and sign records of their inspections. Every private patient has the right to request a personal and private interview with a member of the visiting committee. Most discharges follow a recommendation by the medical officer, but the visiting committees do not necessarily rely solely on the medical staff, and may themselves institute inquiry as to the fitness for discharge of any patients. In the course of a debate on the Committee's report, Mr. Watts expressed the hope that the Committee would take a very strong view with regard to "private lunatic asylums." It should not be in the power of any individual to exploit mental disease. Improper detention occurred largely in such institutions, and although the cancellation of licences might involve claims for compensation, he believed that, in view of the state of public feeling, the Council should accept the risk. Dr. Alan Randle, the recently appointed vice-chairman of the Labour Party on the Council, said he would be sorry if only specialists were consulted in the matter of certification, because they had been so long removed from the ordinary conditions of human life that they might not even be able to detect insanity. The general practitioner, who was more in touch with the ordinary habits and activities of his patients might, if he suspected insanity, call in the assistance of a specialist, who would probably be better qualified to determine the exact type of insanity, if insanity were present. But it was common knowledge that the trouble with the specialist on any subject was the danger of his recognising his "speciality" in almost every case brought to his notice.

LADIES' MEDICAL GOLFING SOCIETY.—The spring meeting will be held at Moor Park Golf Club, Rickmansworth, on March 27th. In the morning a medal round will be played and in the afternoon foursomes against bogey. Entries should be sent to the hon. secretary, Mrs. Laming Evans, 50, Seymour-street, London, W. 1.

NATIONAL LEAGUE FOR HEALTH, MATERNITY, AND CHILD WELFARE.—The annual general meeting of the League and of the National Association for the Prevention of Infant Mortality will be held to-day (Friday, March 21st) at Carnegie House, 117, Piccadilly, London, W., at 4 P.M., with Dr. G. F. Still in the chair. Miss Margaret Bondfield, M.P., will speak on Mothers' Pensions, and Miss Eglantyne Jebb, hon. secretary of the Save the Children Fund, will speak on the Children's Charter.

DEAL: OPENING OF WAR MEMORIAL HOSPITAL.—On March 17th Prince Henry opened the hospital which has been erected, free of debt, at a cost of about £20,000, as a memorial for Deal, Walmer, and district, commemorating some 500 men from nine parishes who gave their lives in the war.

HARNETT *v.* BOND AND ADAM.—At a conference on the bearings of this case, held at the instance of the British Medical Association, it was decided in view of the pending appeal to appoint a small representative committee to watch the situation on behalf of the medical profession and to take such action as may be considered necessary. Those present at the conference included representatives of the British Medical Association, the Medico-Psychological Association, the Medical Women's Federation, the Medico-Legal Society, the Medical Defence Union, and the London and Counties Medical Protection Society.

MENTAL AFTER-CARE ASSOCIATION.—At the annual meeting of the Association held at the Mercer's Hall, London, on March 11th, Sir Charles Wakefield being in the chair, Sir James Crichton-Browne said that the Association had during the past year afforded relief to 1042 patients, each of whom had given excellent testimony to their treatment while in various mental hospitals, and expressed readiness to return should a mental relapse necessitate it. In the report, presented by Dr. Henry Rayner, chairman of the Association, it was stated that since its formation after-care associations had been established in several European countries, in the United States, Japan, and Australia. The chief object of the Association was to restart in life all persons who were convalescent, or had recently recovered from mental illness.

MEDICAL SOCIETY OF LONDON: ANNIVERSARY DINNER.—The 101st anniversary dinner of the Society was held at the Grand Hotel on March 12th, Dr. Herbert Spencer presiding. The toast of the evening was proposed by Sir Humphry Rolleston, who gave a sympathetic account of the foundation of the Society by Lettsom on democratic lines, the first Roll of Fellows consisting of 30 physicians, 30 surgeons, and 30 apothecaries. Dr. Spencer, in responding, said that in one more year the Society would attain the reputed age of Thomas Parr when he died. There were now 620 Fellows, 19 having joined in the course of the year. The concerted research on the results of operation for cancer of the breast was, he said, making progress. Dr. H. A. Des Vœux, in proposing The Services, alluded feelingly to the self-sacrificing labours during the war of the medical officers and of the mercantile marine which had involved much heroism but little glory. Surgeon Vice-Admiral J. Chambers, in responding, spoke of the dangerous plight in which the economic campaign had placed the Naval Medical Service which could not obtain the needed candidates. Better conditions had been provided in the Service for study, work, and research, and he appealed to the teaching schools for their help. Sir John Bland-Sutton proposed The Visitors in words of gentle raillery, coupled with the names of Mr. J. Wheatley, M.P., Minister of Health, and Dean Inge. Mr. Wheatley, in replying, described the office of Minister of Health as one of the dangerous trades, for, since 1919, five men had filled the position. His own relation to medicine was intimate, for he had given his only two children to the medical profession, seeing therein an opportunity, not of making a fortune, but of leading a useful life. He was looking forward to a time when the philosophy of human service was given its proper place in the education of the race; even now medicine was overflowing its scientific limits and coming into relation with other social service. Dean Inge, in his reply, added to the gaiety of the evening. The toast of The President was proposed by Dr. A. F. Voelcker and received with acclamation. Dr. Spencer said how much the Society owed to its hon. secretaries, Mr. T. P. Legg and Dr. F. S. Langmead.

Parliamentary Intelligence.

HOUSE OF COMMONS.

TUESDAY, MARCH 11TH.

Law Relating to Coroners' Inquests.

Mr. DIXEY asked the Home Secretary whether, in view of the general feeling as to the non-desirability of inquest proceedings and magisterial investigations in murder and manslaughter cases being conducted approximately at the same time in different courts and the possible hardships resulting therefrom, he would consider appointing a committee to inquire into the whole matter.—Mr. HENDERSON replied: A Bill for amending the law relating to coroners' inquests is now under consideration, and this is one of the many important points which are receiving attention.

Pauper Lunatics in Asylums.

Major CHURCH asked the Minister of Health whether the Government proposed, in view of the heavy financial burdens imposed on boards of guardians, to introduce legislation increasing the Exchequer grants in respect of pauper lunatics in asylums and making provision for new grants in respect of pauper lunatics, imbeciles, and epileptics maintained under the care of Poor-law authorities in accordance with the recommendations made by the Kempe Committee in 1914.—Mr. WHEATLEY replied: I regret that I cannot give any undertaking as to the introduction of legislation for this purpose.

Medical Officer of Parkhurst Prison.

Mr. HAYES asked the Home Secretary whether the medical officer's duties at Parkhurst Prison were wholly or in part subject to the control or direction of the governor or whether the medical officer was directly responsible to the Prison Commissioners.—Mr. HENDERSON replied: The Governor of Parkhurst Convict Prison is the chief officer to whom the other officers are subordinate, but the medical officer has entire responsibility to the Commissioners, through the governor, for the medical treatment of the convicts.

Case of Harnett v. *Bond.*

Mr. SCURR asked the Minister of Health whether, in view of the verdict of the jury in Harnett *v.* Bond, he proposed to suspend Dr. Bond from acting as Lunacy Commissioner pending the decision of the Court of Appeal.—Mr. WHEATLEY replied: Without entering into a discussion of a case which is still sub judice, I would draw attention to the fact that Mr. Justice Lush, in the course of the discussion which took place in court after the jury had returned their verdict, stated that he agreed that there was no evidence of any dishonesty or *mala fides* on the part of Dr. Bond. In view of this fact and of Dr. Bond's long and distinguished record of public service and his eminent position in the scientific world, I see no reason to take such action as is suggested in the hon. Member's question.

Mr. LANSBURY asked the Prime Minister whether he would cause to be laid upon the Table of the House of Commons the minutes of evidence in the case of Harnett *v.* Bond before any estimate was submitted to the House for the purpose of indemnifying Dr. Bond; and whether he would state on what ground this case was being taken to the Court of Appeal at further cost to the public.—Mr. WHEATLEY replied: The transcript of the shorthand notes of the evidence is extremely bulky, and such copies of it as are available are, I understand, required for the purposes of the proceedings in the Court of Appeal. After the appeal has been disposed of, I will consider whether it is practicable to make the transcript available for the information of hon. Members. The answer to the second part of the question is that the case is being taken to the Court of Appeal in the public interest.

Remuneration of Panel Doctors.

Sir KINGSLEY WOOD asked the Minister of Health whether he was now is a position to bring forward his proposals relating to the increased payment proposed to medical men on the panel lists.—Mr. WHEATLEY replied: The matter referred to by the hon. Member is still under consideration, and I am not yet in a position to make a statement on the subject.

The Spahlinger Treatment.

Sir WALTER DE FRECE asked the Minister of Health the present attitude of the Government with regard to the Spahlinger treatment.—Mr. WHEATLEY replied: I am anxious to arrange for a scientific investigation of this method of treatment in this country, and have personally given Mr. Spahlinger assurances to that effect.

THURSDAY, MARCH 13TH.

Army Medical Services.

On the motion that "the Speaker do leave the chair on the Army Estimates 1924–25,"

Mr. STEPHEN WALSH, Secretary of State for War, said that the health of the troops continued to be most satisfactory, particularly as regarded avoidable diseases, which showed a marked decrease during the year in spite of the fact that the Government had saved money on medical services. Reductions of over £100,000 had been made and the regimental establishment of the R.A.M.C. was again being reviewed.

Lieut.-Colonel FREMANTLE called attention to the very serious condition the Army was in owing to the position of the Royal Army Medical Corps. He said he had drawn the attention of the late Under Secretary for War to the lack of candidates for that Service. There were 15 vacancies advertised and only four candidates came forward; 11 vacancies were still unfilled. There was no selection whatsoever. Although two months' notice was afterwards given he believed that the result had been that for 40 vacancies only eight candidates had presented themselves. The whole force was being starved of officers from the very start. This matter required serious inquiry. The result had been to block promotion. The thing was utterly top-heavy. They had 101 colonels, 343 majors, 422 captains, and only 7 lieutenants. He believed that the same difficulty existed in connexion with the Colonial Medical Services. There ought to be a really competent inquiry into the recruitment of medical officers for public services. He would also like to know what had been done to secure coördination, particularly of the medical services, medical stores, medical personnel, and medical institutions, so that they might be used with greater economy and efficiency.

The motion that "the Speaker do leave the chair" was then agreed to.

Mental After-Care of Ex-Service Men.

Mr. PIELOU asked the Minister of Pensions whether he had invited the Mental After-Care Association to draft a scheme for the purpose of looking after ex-Service men discharged from asylums; and, if so, was he prepared to meet the cost of such scheme.—Mr. F. O. ROBERTS replied: The answer to the first part of the question is in the negative, but for some time my department has been in communication with the Mental After-Care Association with a view to exploring as to how far the Association's activities in connexion with the after-care of civilians discharged from asylums would embrace the pensioner. We welcome the coöperation of the Association, but I would remind the House that in so far as the pensioner when discharged from an asylum will need treatment or institutional care the necessary provision is made by my department.

Lunacy Law Reform.

Sir ELLIS HUME-WILLIAMS asked the Home Secretary whether, in view of the fact that the system under which alleged lunatics were apprehended and interned in asylums was not in question in the case of Harnett *v.* Bond and would not be affected by any judgment which the Court of Appeal might pronounce upon the facts of that particular case, he would proceed at once with the appointment of a committee to examine the system without waiting until the appeal could be heard.—Mr. GREENWOOD replied: The suggestion is under consideration and my right hon. friend hopes to be able to make an announcement very shortly.

Effect of the Dangerous Drugs Act.

Lieut.-Colonel FREMANTLE asked the Home Secretary the actual effect of the Dangerous Drugs Act, 1923, in checking the illicit importation of such drugs.—Mr. HENDERSON replied: The Act came into force towards the end of last May and its full effect on the smuggling of drugs into this country and on the illicit traffic generally cannot yet be estimated. The additional powers, however, given by the Act have already been found of great value, and the heavier penalties which the courts are now empowered to impose have already, it is believed, had a deterrent effect on the traffic.

International Opium Traffic.

Lieut.-Colonel FREMANTLE asked the Home Secretary the present position as to the regulation of the international opium traffic and restriction of production.—Mr. HENDERSON replied: The hon. and gallant Member will be aware that the general supervision of the traffic is entrusted to the League of Nations so far as its members are concerned, subject to the provisions of the international conventions in force, and that the League has appointed an advisory committee to deal with the subject. The proceedings of this committee and the action taken by the League and the several Governments on its recommendations will be found in the official publications of the League. As a result of the preparatory work done by the committee, it was decided at the assembly of the League last September to call two international conferences this year to consider the Far Eastern situation, and the question of the restriction of production respectively. If there is any particular point on which the hon. and gallant Member desires information, perhaps he will put down another question.

Miner's Nystagmus and Compensation.

Major ROPNER asked the Secretary for Mines whether the Home Office is considering the scheduling of nystagmus as a disease under the Workmen's Compensation Act; and whether the malady was so scheduled in any other country.—Mr. HENDERSON replied: Miner's nystagmus has been scheduled under the Act ever since 1907. As explained in reply to a question by the hon. Member for Ormskirk on the 21st ultimo, proposals for altering the description of the disease in the schedule are under consideration. I understand that compensation is payable in respect of the disease in Belgium, France, Germany, and certain States of the United States of America.

Pensions Medical Administration.

Mr. BENJAMIN SMITH asked the Minister of Pensions whether the Director-General of Medical Services had direct access to the Minister and full control of the medical branch.—Mr. F. O. ROBERTS replied: The arrangements for the control and organisation of the Ministry of Pensions follow the lines adopted in other large departments of State. The heads of the divisions are responsible to me through the Permanent Secretary for the proper control of the work of their respective branches, and I personally consult them whenever I consider it necessary to do so.

Health Insurance Finance.

Mr. TURNER asked the Minister of Health what was the total of the contributions paid into the National Health Insurance Fund in 1922; what proportion was paid by employers, employees, and the State, respectively; how much was paid out in sickness, disablement, and maternity benefits, respectively; how much was paid to panel practitioners; and what was the total balance in the insurance funds.—Mr. WHEATLEY replied: The figures relating to England and Wales for 1922 are as follows: The total of the contributions by employers and employees paid into the National Health Insurance Fund was £22,384,000, of which approximately £11,742,000 was paid by employers and £10,642,000 by employees. The State contribution which takes the form of payment of the statutory proportion of the cost of National Health Insurance benefits and administration, together with sundry grants-in-aid and cost of central administration was £7,429,000. The amounts paid out under the headings specified in the question were: Sickness benefits, £8,273,000; disablement, £3,287,000; maternity, £1,606,000; payment to insurance practitioners, £6,317,000. The accumulated funds at the end of the year amounted to about £90,000,000.

TUESDAY, MARCH 18TH.

Ex-Service Men and Malaria.

Sir FREDERIC WISE asked the Minister of Pensions how many cases of ex-Service men suffering from malaria had been dealt with this year; and how many of the cases had been refused the pension.—Mr. F. O. ROBERTS replied: During the months of January and February 189 first claims to pension in respect of malaria were decided by the Ministry. In 89 of these compensation was awarded.

Trials of Lunatics.

Sir MURDOCH MACDONALD asked the Home Secretary whether, in view of the fact that Lord Justice Atkin's committee on the procedure at the criminal trials of lunatics alleged to be insane was composed solely of the legal profession, and that its report did not meet the objections put forward in the report of the Medico-Psychological Association as regards the retention of the McNaghton rules and other disputed points, and considering that the two subjects, criminal lunacy and lunacy reform, were intimately allied, he would also refer the question of the criminal trials of lunatics to the Royal Commission now being appointed to consider the subject of lunacy reform.—Mr. HENDERSON replied: The matter will be considered.

Deafness and Pensions.

Mr. COMYNS CARR asked the Minister of Pensions if he would state on what grounds the maximum disability on account of total deafness was only 70 per cent.; and whether he would consider the possibility of increasing it to 100 per cent., so that the totally deaf man might be placed on equal terms with those disabled in other ways.—Mr. J. W. MUIR replied: The assessment for total deafness was fixed in the early days of the Ministry in accordance with the highest medical advice. My right hon. friend is not prepared to admit that it compares unfavourably with the other assessments for specific injuries laid down in the first schedule to the Royal Warrant.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, March 24th.

ODONTOLOGY: at 8 P.M.
Casual Communication:
Mr. E. Fish: A Compound Composite Odontome.
Paper:
Mr. G. Northcroft: The Clinical Aspect of the Care of Children's Teeth.

Tuesday, March 25th.

MEDICINE: at 5.30 P.M.
Papers:
Prof. G. Monod: Hæmatemesis without Lesions.
Dr. Oliver Heath: The Clinical Interpretation of Fever.

Wednesday, March 26th.

COMPARATIVE MEDICINE: at 5 P.M.
Paper:
Dr. N. S. Lucas: A Comparison of the Pathology of Captive Animals with that of Man (with specimens obtained from the Zoological Society's Gardens).
A discussion will follow, opened by Prof. G. H. Wooldridge.

MEDICINE.
PATHOLOGY.
THERAPEUTICS AND PHARMACOLOGY.
Members of these Sections are specially invited to attend and to take part in the discussion.

Thursday, March 27th.

UROLOGY: at 8.30 P.M.
Paper:
Mr. Clifford Morson: Treatment of Carcinoma of the Prostate.
A discussion will follow, in which Prof. Russ and others will take part.

Friday, March 28th.

STUDY OF DISEASE IN CHILDREN: at 5 P.M. (Cases at 4.30 P.M.)
Cases:
Dr. Vincent Coates: Progressive Lipodystrophica in a Boy of 7 Years.
Other cases will be shown.
Discussion:
On Enuresis.
To be opened by Dr. Dingwall Fordyce, followed by Mr. Ralph Thompson, Dr. J. M. Smellie, and others.

EPIDEMIOLOGY AND STATE MEDICINE: at 8 P.M.
Paper:
Dr. R. Dudfield: A Survey of the Mortality due to Child-bearing in London, from the Seventeenth Century.

HISTORY OF MEDICINE.
OBSTETRICS AND GYNÆCOLOGY.
Members of these Sections are specially invited to attend.

HUNTERIAN SOCIETY.
MONDAY, March 24th.—7.30 P.M. Dinner Meeting at Simpson's Restaurant, Bird-in-Hand-court, Cheapside, London, E.C., Dr. Poynton: Rheumatics.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES, 11, Chandos-street, Cavendish-square, W.
FRIDAY, March 28th.—8.30 P.M., Discussion on Gonorrhœa Infection by Secondary Organisms, to be opened by Colonel E. T. Burke, followed by Dr. Lydia Henry.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, March 25th.—5 P.M., Dr. Leonard G. Parsons: Wasting Disorders of Early Infancy. (First Goulstonian Lecture.)
THURSDAY.—5 P.M. (Second Goulstonian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.
MONDAY, March 24th, to SATURDAY, March 29th.—BETHLEM ROYAL HOSPITAL. Course in Psychological Medicine. Tues. and Sat., 11 A.M., Dr. Thomas Beaton and Dr. Porter Phillips: The Psychoses.—CHELSEA HOSPITAL FOR WOMEN. Daily: Operations, &c. Mon., 2 P.M., Mr. Banister: Backward Displacement. Tues., 11 A.M., Mr. Galletly: Demonstration in Wards, Gynæcological Histories. Wed., 2 P.M., Mr. Ellison: Vaginal Discharge. Thurs., 9.30 A.M., Mr. Provis: Sterility. Fri., 2 P.M., Mr. Comyns Berkeley: Cervical Fibroids.—ROYAL FREE HOSPITAL. Wed., 5.30 P.M., Dr. Heald: The Uses of other Electrical Currents.—ROYAL WATERLOO HOSPITAL. Lecture-Demonstrations, Ward Work, &c. Mon., 2 P.M., Dr. Woodwark; 3 P.M., Dr. Barron; 4 P.M., Dr. Donaldson. Tues., 2 P.M., Dr. Moon; 3 P.M., Dr. Myers; 4 P.M., Dr. Davidson. Wed., 1.30 P.M., Mr. Cairns Forsyth. Thurs., 1.30 P.M., Dr. Perkins; 2.30 P.M., Mr. Bickerton; 3.30 P.M., Dr. Tindal Atkinson. Fri., 2 P.M., Dr. Perkins; 4 P.M., Mr. Beevor. Sat., 9.30 A.M., Mr. Frankau (Operations). Further particulars can be obtained from the office at No. 1, Wimpole-street, W. 1.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith.
MONDAY, March 24th.—10 A.M., Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Simmonds: Out-patients (Surgical). 2 P.M., Mr. Simson: Diseases of Women.
TUESDAY.—10 A.M., Mr. Steadman: Dental Department. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Diseases of Throat, Nose and Ear.
WEDNESDAY.—12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Dr. Owen: Medical Out-patients. 2 P.M. Dr. Pernet: Skin Department.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Mr. MacDonald: Genito-Urinary Department.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 10.30 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily 10 A.M., to 6 P.M., Saturdays, 10 A.M., to 1 P.M. In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital.
(At 4.30 P.M.)
MONDAY, March 24th.—Mr. T. H. C. Benians: Chronic Bacterial Infections of Mucous Surfaces.
TUESDAY.—Dr. J. Metcalfe: A Survey of Progress in X Ray Diagnosis.
WEDNESDAY.—Dr. J. Browning Alexander: Hæmoptysis.
THURSDAY.—Mr. J. Bright Banister: Disturbances in Micturition.
FRIDAY.—Dr. L. R. Yealland: Clinical Demonstration of Cases.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, March 24th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Disseminated Sclerosis: Dr. Birley.
TUESDAY, March 25th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Cerebral Topography: Mr. Armour.
THURSDAY, March 27th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Diseases of Bone: Dr. Russell J. Reynolds.
FRIDAY, March 28th.—2 P.M. Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Demonstration of Physical Exercises in the Exercise Room.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, March 24th.—12 noon, Syringomyelia, Hydromyelus and Allied Conditions: Dr. J. G. Greenfield.

COURSE OF LECTURES AND DEMONSTRATIONS ON THE NEUROLOGY OF THE EYES.
WEDNESDAY, March 26th.—3.30 P.M., The Central Visual Paths: Mr. Leslie Paton.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday.
All applications should be sent to the Secretary, Medical School.
J. G. GREENFIELD, Dean of Medical School.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st. W.C.
THURSDAY, March 27th.—4 P.M., Mr. Fairbank: Scoliosis.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, March 27th.—5 P.M., Dr. Roberts: The Lying-in.

CANCER HOSPITAL, Kensington, S.W.
WEDNESDAY, March 26th.—4.30 P.M., Sir Thomas Horder: The Nutritional Factor in Malignant Disease.

VICTORIA UNIVERSITY OF MANCHESTER MEDICAL SCHOOL.
FRIDAY, March 28th.—5.30 P.M., Prof J. C. Brash The Genesis and Growth of Deformed Jaws and Palates.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.
TUESDAY, March 25th.—4.15 P.M., Dr. J. Shaw Dunn: High Colour Index Anæmias.

MANCHESTER BABIES' HOSPITAL POST-GRADUATE LECTURES.
FRIDAY, March 28th.—5.30 P.M., Dr. Jenkins: Vaccines and their Use in the Treatment of Infants.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)
MONDAY, March 24th.—(At the Children's Hospital.) Dr. W. Johnson: Poliomyelitis.
TUESDAY.—(At the Southern Hospital.) Dr. W. Johnson: Idiopathic Epilepsy.
WEDNESDAY.—(At the Northern Hospital.) Dr. Pemberton: Diagnosis and Treatment of Abnormal Conditions in Upper Alimentary Tract.
THURSDAY.—(At the Stanley Hospital.) Dr. Wadsworth: Diabetes.
FRIDAY.—(At the Royal Infirmary.) Mr. A. E. Burroughs: Medical Ophthalmoscopy with Lantern Illustrations.

Vacancies.

For further information refer to the advertisement columns.

Ayr County Hospital.—Sen. Res. H.S. £100.
Barbados General Hospital.—Jun. Res. S. £250
Birmingham Union, Selly Oak Hospital.—Res. Asst. Med. Supt. £550.
Bradford City.—Bacteriologist and Pathologist. £750.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £120.
Bury Infirmary.—Jun. H.S. £150.
Cancer Hospital, Fulham-road, S.W.—H.S. £100.
Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—H.S. £100. Jun. H.S. £50.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Radiographer.
Coventry and Warwickshire Hospital.—Res. H.S. £150.
Croydon Union, Mayday-road Hospital, &c.—Second Asst. M.O. £300.
Dublin University, Trinity College.—Prof. of Pathology. £800.
Durham County Council Education Dept.—Asst. Sch. M.O. £600.
Evelina Hospital for Children, Southwark, S.E.—H.S. and H.P. Each £60.
Guildford, Royal Surrey County Hospital.—H.S. £150.
Guy's Hospital, Salomons Infant Welfare Centre.—M.O. £350.
Hampstead Council of Child Welfare, 27, Heath-street, N.W.—Maternity &c., M.O. £100.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Med. Reg. £100.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. £50.
Hull City Asylum.—Med. Supt. £1000.
Keighley, Victoria Hospital.—H.S. £180.
Leeds City.—Chief Clin. Tub. O. £900.
Leeds, Ministry of Pensions Hospital, Beckett Park.—Radiologist. £600.
Leicestershire and Rutland Mental Hospital, Narborough, near Leicester.—Second Asst. M.O. £350.
London Jewish Hospital, Stepney Green, E.—Cas. O. £200.
London Lock Hospital, 91, Dean-street, W.—H.S. £200.
London Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. and Med. Reg. Each 40 guineas.
Manchester, Victoria Memorial Jewish Hospital.—Secy. and Supt. £350.
Norfolk County Council.—Asst. Tub. O. £600.
Norwood and District Cottage Hospital, 77a, Westow Hill, S.E.—Hon. Anæsthetist.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Asst. S.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each £150.
Prince of Wales's General Hospital, Tottenham, N.—Two H.S.'s, H.P. Each £150. Jun. H.S. and Jun. H.P. Each £110.
Prison Medical Service.—M.O.'s. £504 14s.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—Asst. S. R.M.O. £200.
Rochdale Infirmary and Dispensary.—Jun. H.S. £200.
Royal Chest Hospital, City-road, E.C.—H.P. £100.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. P.
Royal Westminster Ophthalmic Hospital, King William-street, W.C.—Asst. H.S.
St. Thomas's Hospital.—Ophth. Reg.
Sheffield Royal Hospital.—Asst. Cas. O. £100.
Stoke-on-Trent, North Staffordshire Infirmary.—H.S. £200.
Surrey County Council.—Asst. M.O.H. £660.
Western Australia, Medical and Health Dept.—Bacteriologist and Pathologist. £708.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. Non.-Res. H.S.'s. £150 and £100 respectively.
York County Hospital.—H.P. £150.
York Dispensary.—Res. M.O. £175.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Portree, Inverness; Shap, Westmorland; Winslow, Buckingham; Wartle, Aberdeen.

Births, Marriages, and Deaths.

MARRIAGES.

CORMACK—MCRAE.—At Christ Church, Rangoon, on Feb. 5th, 1924, Major H. S. Cormack, *M.C.*, I.M.S., eldest son of John Cormack, of Corstorphine, Edinburgh, to Dorothy, only daughter of the late George William McRae and of Mrs. Isobel McRae, Felpham, Sussex.

DEATHS.

BALLINGALL.—On March 9th, at Cloudesley-road, St. Leonards-on-Sea, George Anderson Ballingall, M.D., aged 63 years.
FITZMAURICE.—On March 11th, at St. Flora's-road, Littlehampton, Richard Fitzmaurice, L.R.C.S., L.R.C.P., late of Lindfield, aged 72.
HOOD.—On March 15th, at Boundary-road, St. John's Wood, of heart failure, following influenza, Donald William Charles Hood, C.V.O., M.D., F.R.C.P., aged 76 years.
JOSLING.—On March 12th, at a nursing home in Hastings, Lieut.-Colonel Charles Langford Josling, late of the R.A.M.C.
MICHAEL.—On the 7th of March, at 7, Canfield-gardens, N.W. 6, Gustave Michael, M.B., C.M. Edin., aged 61.
WOMACK.—On March 11th, at The Croft, Finchampstead, Berks, Frederick Womack, M.B., B.Sc.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE HEALTH OF THE SOUDAN.

FOUNDATION OF A NEW MEDICAL SCHOOL.

WHILE our responsibility for the health of Lower Egypt is becoming less direct, medical administration in the Soudan remains, as before, in the hands of British officials. This fact lends interest to the report on the Administration and Condition of Soudan in 1922, prepared by the Governor-General, Major-General Sir Lee O. F. Stack. This report records the retirement on pension of, amongst other officials, Dr. E. S. Crispin, C.B.E., Director of the Medical Department, which he joined in 1904 after three years' service with the Medical Corps of the Egyptian army. He was first posted as medical officer to Halfa Province, and was subsequently transferred to the Red Sea Province just at the beginning of the development of Port Soudan; for nearly five years he had charge of that province, and carried the very difficult work of public health and quarantine to a high degree of efficiency. In 1909 he was transferred to Khartoum as assistant director of the department. In 1916 he was appointed Director and also President of the Central Sanitary Board, posts which he held until his retirement in August, 1922. In addition to his other duties, he was a member of the Governor-General's Council from September, 1919. "The present efficiency of the medical department is due," it is added, "to a large extent to the energy, personality, and powers of organisation of Dr. Crispin, and his retirement is a loss which will be keenly felt both by the medical department and the Central Government." Dr. Crispin's successor is Dr. O. F. H. Atkey.

Training of Assistant Medical Officers.

Perhaps the most noteworthy feature of the year, as regards public health, was the gratifying success which has attended the training of native assistant medical officers. Two of them carried out very valuable work in Dongola, where a severe epidemic of bilharzia had broken out in connexion with the pumping stations at Nuri and Gureir, and also at Magall and Tangassi Island; 5478 injections of antimony tartrate were made, 455 cases were cured, and these areas of infection are now clear. Their work at various hospitals in the provinces has also been consistently well reported on, and is a most encouraging sign for the future. During the summer five assistant medical officers received a course of laboratory training. It is hoped in time to give this additional microscopic training to all, so that when attached to a hospital they can carry on the necessary microscopical work—e.g., staining for, and recognising, malarial parasites, &c.

In civil hospitals the number of in-patients decreased by 922, from 18,664 to 17,742; and out-patients by 20,370, from 376,097 to 355,727. The decrease is mainly attributable to the general shortage of money and the closing down of the work at Makwar Dam. Military hospitals treated 3960 civil in-patients and 59,936 out-patients, as compared with figures of 3174 and 39,314 respectively in 1921. The increase in the number of out-patients is mainly due to a large increase of the work at Rumbek. Apart from a heavy incidence of malaria all over the Soudan, due to exceptional heavy rains, public health has been good. Malaria was especially prevalent in Khartoum and Omdurman.

Epidemics and Preventive Measures.

An epidemic of small-pox broke out last winter at Khartoum among recent immigrants from Kordofan: it spread up the Blue Nile as far as Roseires and up the White Nile as far as Kosti. Later in the summer it spread north to Atbara, Sinkat, and Port Soudan, but the outbreaks in these provinces were very limited. Fortunately both in the provinces north of Khartoum and in the Blue Nile Province, where the population is densest, vaccination has been very thorough. The total number of cases was approximately 179, of which 13 proved fatal. The number of vaccinations performed in connexion with this epidemic was 191,577. A small outbreak of cerebro-spinal fever occurred among the labourers working on the new pumping station at Wad-el-Nan in December. Vigorous measures were taken and the outbreak was strictly limited. There were 32 cases, of which 28 died.

The hospital ship (*Lady Baker*) was put in commission, and was handed over to the medical authorities at Malakal at the end of March. She returned to Khartoum at the end of June. During this period she made six tours, in the course of which many places were visited where previously the natives had had no opportunity of receiving medical assistance; 1094 natives were attended, and 1040 injections of novarsenobenzol were given. A report from Bahr-el-Ghazal Province mentions that sleeping sickness is still a formidable menace in Tembura district, but the plan initiated in 1921, of collecting the Azande into villages in

cleared areas, is being steadily followed, and should result in a considerable check to the disease. The scheme is disliked locally, inasmuch as it involves changing the habits of the people who are accustomed to live in separate homesteads in the forest. An additional district commissioner is, however, being appointed to this district for the express purpose of supervising anti-sleeping sickness measures, and it is hoped that a wider realisation of their benefit will result, and that the coöperation of the people will be secured.

The New Medical School.

During the year under review a complete medical survey was made for the first time of all boys entering the Gordon College and Omdurman School. Similar surveys, but rather less complete, were carried out at Port Soudan, Atbara, and Wad Medani schools. These surveys cannot fail to be of the greatest assistance to the teaching staff, and it is hoped to continue them every year. Very excellent work has been carried out at the Midwives School in Omdurman. In the course of the year 15 midwives received training and were granted licences. Two new hospitals, one at Kassala and the other at Halfa, have been completed and are now in use. New dispensaries have been opened at Resik in the Upper Nile Province, and at Rashad, Nuba Mountains Province. At Nahud a new hospital is in process of erection. The new building for the Medical School, Khartoum, will, it is hoped, be soon completed and ready for use.

Major R. G. Archibald, D.S.O., Director of the Wellcome Research Laboratories, reports that, in spite of the large number of routine examinations performed, researches have been carried out on various problems and progress has been maintained in all sections. In the bacteriological section the routine work has been particularly heavy; 5255 examinations, constituting a record number for this section, were carried out, while over 800 Wassermann tests were performed. Various researches have been carried out on cattle anthrax, epidemic jaundice, Malta fever, bilharziasis, sleeping sickness, and dysentery. Laboratory investigations proved the interesting fact that *Trypanosoma rhodesiense* was the cause of certain cases of sleeping sickness in Tembura, Bahr-el-Ghazal Province. A mollusc survey was carried out in a part of the province of Dongola in May. The result showed that the mollusc *Isidora innesi* was the intermediate host responsible for the spread of bilharzia in that province.

The Gordon Memorial College at Khartoum celebrates its coming of age this year and the establishment of a medical school there is the realisation of a scheme which had the warm support of the late Lord Kitchener. The close association of medical school, civil hospital, and research laboratories is of happy augury for the success of the scheme.

RESCUE AND PREVENTIVE INSTITUTIONS.

THE Public Health Department of the London County Council has issued a second edition of the handbook of information on rescue and preventive institutions. This includes a list of homes and hostels for those suffering from venereal disease, an appendix of institutions dealing with cases of mental deficiency, as well as alphabetical and classified indexes of the homes. The handbook was first drawn up by Sir William Hamer in 1921, following an inquiry made by Dr. F. N. Kay Menzies into the scope of the work done by various voluntary societies. Workers were then found to be frequently frustrated by lack of knowledge about available facilities, and information was therefore supplied in this handy and compact form. The second edition has been brought up to date, and may be purchased from Messrs. P. S. King and Son, Ltd., 2 and 4, Great Smith-street, London, S.W. 1 price 1*s.* 3*d.*

ENTRY OF MEDICAL STUDENTS IN 1923.

WITH reference to the graph which appeared on p. 579 of our issue of March 15th, it has been pointed out to us that the number of medical students who were registered last year by the General Medical Council is not a precise indication of those who actually entered upon the curriculum. A certain number of students who would, under the old regulations, have begun the study of chemistry and physics in October, only began their pre-registration work at this time, and instead of being registered in that month will probably register some time this year. It appears, further, that the northern universities are not making arrangements to bring the new curriculum into force until the current year. Consequently students who commence study there are not at present registered. There is no doubt, however, that after these corrections have been applied there will remain a considerable drop in numbers, although it will not be so large as is indicated by the graph, when 1923 and 1924 are reviewed together. By reason of the revised curriculum the year 1923 was in some degree an interregnum.

AN IMPROVED MEDICAL CASE.

THE disastrous results which may follow the hasty picking up of a bag of the attaché type which has not been properly fastened are entirely obviated by an extremely ingenious handle fitted to the bags made by Messrs. E. Gonville and Co., of 37, Walbrook, London, E.C. 4. This handle, which in appearance is similar to the ordinary bag handle, is split longitudinally down the centre, one half being fixed to one side of the bag, and the other half to the opposite side. The bag cannot be closed without first fitting together the extreme ends of each half of the handle, and then closing the halves as one would shut a purse. The two halves of the handle are provided with a catch and a lock and key. The action both of opening and shutting the bag is simply and quickly performed. The prices range from 17*s.* 6*d.* for a 14 inch, to 25*s.* for a 20 inch bag. Special sizes are made to order.

TSETSE-FLY INVESTIGATION IN NIGERIA.

A NOTE on the tsetse-fly investigation now in progress in Nigeria by Dr. T. B. Adam, Acting Director of the Medical and Sanitary Service, is included in the address delivered by the Governor, Sir Hugh Clifford, at the Second Session of the Legislative Council held at Lagos on Feb. 11th.

The base camp for investigation during the past year has been situated in an important tsetse belt which cuts across the main roads between Azare and Hadeija in the Kano Province. An intensive study has been made of the trypanosome infections and food of the two species of tsetse, *G. morsitans* and *G. tachinoides*, which occur in this area. In order to obtain a continuous record of these features it has been necessary to make daily dissections of the flies. In all some 30,000 such dissections have been carried out, and from the figures so obtained mathematical curves have been prepared which show a regular rise and fall according to the movements of the game animals and the changes of the seasons. A most careful study of the breeding haunts of the flies has been prosecuted and a knowledge of the seasonal variations of breeding has been obtained, so that it is now considered that sufficient information has been acquired to justify large-scale experiments. The objective of these experiments is the determination of the vexed question of the relationship of *G. morsitans* and big game. Treatment of cases of sleeping sickness by Bayer "205" has been undertaken and the immediate results are most satisfactory. Patients brought in moribund for the first injection have been known to walk in with assistance for the second treatment two days later. The permanence of these results has yet to be tested, and much work remains to be done in determining the number of doses which can be regarded as effective in various stages of the disease, at different ages, and in all the different conditions that may be met with.

SANTOPERONIN.

IN our notice of a new anthelmintic (THE LANCET, Feb. 23rd, p. 398) we reported that it differed from the maker's description in containing sulphate. Since then we have received further reports on this substance, according to which it is a mixture containing inter alia salicylic acid as well as sulphate, and cannot be regarded as a definite chemical compound. Investigations made at the State Institute for Pharmaco-Therapeutic Investigations, Leiden, Holland, suggest that the anthelminthic action is uncertain and inferior to that of santonin itself.

Messrs. H. K. Lewis and Co., Ltd., have arranged to act as agents in the British Isles for the publications of the Chemical Catalog Company, U.S.A., and will supply a list of these works on demand. All the principal books are kept in stock.

R. G.—The word "apostemate," although perfectly good sixteenth-century English, has long become obsolete, and "suppurate," which is good English Latin, has taken its place. There seems no sufficient reason for its revival. Even when "apostemate" and kindred words were current they seem to have been used uneasily, for all kinds of spelling are to be found—e.g., apostemate, apostumate, aposteme, apostume, aposthume, imposthume, apostem.

R. S.—There seems no doubt that the medical officer at an infirmary is entitled to sign lunacy certificates unless he is disqualified for the reasons stated in the Act and printed on the back of the certificate. There is much to be said for the officer employed by the guardians himself signing the certificate, for the guardians have to pay, and may reasonably require their officer to examine. No doubt it is advisable for anyone who has to sign lunacy certificates to join one or other of the medical defence societies, and, in addition to this, he would be prudent to keep a careful note of the circumstances in every case.

An Address

ON

VITAMINS AND THE BORDERLAND BETWEEN HEALTH AND DISEASE.

Read before the Section for Maternity and Child Welfare of the Society of Medical Officers of Health on Jan. 16th, 1924.

BY W. CRAMER, D.SC. EDIN., PH.D. BERL., M.R.C.S. ENG.

IT has been said that the two chief causes of disease and death are food and drink. But when we sit down to dinner we do not merely supply our bodies with fuel and in doing so run the risk of disease and death. If we have chosen our food wisely and prepared it carefully, it will supply us with certain stimulating drug-like substances which have a tonic effect on specific tissues and which, so far as we know at present, cannot be replaced by any other known drug. These substances are the vitamins, or as Hopkins originally called them, the food-accessory substances.

According to the current conception it would not be paradoxical to define a vitamin as an unknown substance present in the food having an unknown action. It has, in fact, been denied that they have any positive action. Their existence was recognised by what happened not when they were present but when they were absent. There is nothing extraordinary in this fact since the endocrine function of many organs such as the ovary, the testes, and the thyroid was recognised by what happened after their removal.

The effects produced by the absence of vitamins are characteristic and specific for each vitamin. In every case the administration of the missing vitamin relieves the specific condition with a certainty and a rapidity which is one of the most striking and unique phenomena in medicine.

VITAMINS IN ORDINARY DIET.

Not infrequently it is said that these facts, although important and interesting from the scientific point of view, have little bearing on practical problems of nutrition, because under the conditions of modern civilised life deficiency diseases are rare. The ordinary mixed diet on which we live is said to contain sufficient vitamins to prevent the onset of these diseases. This view—expressed not only by clinicians who are sceptical about the application of the results of laboratory experiments to man, but even by those who are engaged in the actual study of vitamins—I hold to be mistaken. It is true that there is no difficulty in constructing from the ordinary articles of food a diet which contains an ample supply of vitamins. But the diet of large classes of the population is in fact so poor in vitamins as to impair health, especially in children. This fact is due partly to economic reasons, but mainly to ignorance on the part of the consumer, and on the part of those concerned with the preparation of food on a large scale before it reaches the consumer—especially the milling of flour for bread, the manufacture of margarine, and the tinning of meat and vegetables. Again, a misconception of the mode of action of vitamins has led to under-estimation of the practical importance of these substances in nutrition, even by many ardent supporters of the vitamin theory; and the harmful effects of a restriction in the intake of vitamins, insufficient in itself to produce an obvious and typical deficiency disease, have received little attention. In the numerous investigations on vitamins, animals in full health on an ample supply of vitamins have been compared with animals in which a typical deficiency disease had developed as the result of the complete absence of one or other vitamins. But the borderland between health and disease, the borderland created by a restriction in the intake of vitamins, has remained unexplored.

KERATOMALACIA IN DANISH AND ENGLISH CHILDREN.

Before dealing with this unrecognised aspect of the vitamins, I should like to point out that even in the immediate past deficiency diseases were of more frequent occurrence even in Europe and in this country than is generally recognised. The cause and cure of infantile scurvy or Barlow's disease, now known to be due to a deficiency in the vitamin C, was, of course, known long before the vitamin conception was developed. But the cause and cure of a condition of defectivenutrition in children, which is normally associated with an affection of the eyes, has only recently been understood as being due to a deficiency in the fat-soluble vitamin A. Curiously enough, the European country in which this condition has occurred with exceptional frequency is Denmark, one of the largest producers of butter and dairy produce which are the vehicles of vitamin A; for Denmark exported too much of its vitamin A and substituted for it margarine devoid of this vitamin. The cases described very fully by Bloch[1] occurred in a group of children kept in an institution. Other two groups of children kept in the same home did not develop the disease. The diet of these three groups differed: Group A, which comprised infants and delicate children, had chiefly whole milk and milk puddings. This group did not develop the disease. The older children, Group B, received a more varied diet, which may be given fully for its interest:—

Breakfast: Oatmeal, bread and beer soup, and a little fresh milk.
Mid-day dinner:—First course: Milk puddings, oatmeal, soups (fruit juice or meat broth). Second course: Fish or meat and mashed potatoes.
Afternoon: Cocoa with bread and margarine.
Evening: Milk pudding, bread and margarine.

The margarine was vegetable margarine and all food was prepared with this margarine. The milk used was half-skimmed milk. The children received no butter, cream, or eggs. Group B was divided in two subsections, B1 and B2. In Group B1 the eye disease developed, while the Group B2 remained free. And it was found that the group that remained free had received regularly a small amount of whole milk for breakfast, while the matron who looked after the third group in which the eye affection appeared, had not given whole milk for breakfast. The disease disappeared when cod-liver oil was given. Here, therefore, in spite of a varied and apparently nutritious diet an almost complete deficiency in vitamins was established.

Similar outbreaks of epidemics which were associated with an eye affection have occurred in this country during the last 40 years in various industrial schools and have been recorded in the literature. The last recorded outbreak was in 1911 and was investigated by Dr. J. P. McGowan and Dr. C. McNeil.[2] Clinically, the outstanding feature of these epidemics is described by the authors as a "distorted" pneumonia which may vary in type from a fulminating rapidly fatal type to an abortive or latent group of febriculæ. The authors draw special attention to the fact that there was also very prevalent in this school a chronic granular conjunctivitis. McGowan and McNeil clearly recognised the non-contagious nature of the epidemic, but they were unable to explain the nature of the disease or to recommend a rational treatment. The diet had been carefully drawn up by a high scientific authority. At that time experiments on animals had not yet clearly revealed the existence of vitamins. The discovery of these food factors, the distinction between the vitamin A and B, and the experimental production of an eye affection by withholding vitamin A from the food date from the years immediately following this outbreak. When the next outbreak occurred in the same industrial school in 1919 Dr. Marshall Findlay, who was sent down to investigate the matter, was struck by the resemblance

[1] Journal of Hygiene, 1921, xvii., 283.
[2] Edinburgh Medical Journal, 1913, x., 201.

of this condition to the keratomalacia produced experimentally in rats by vitamin A deficiency. He at once inquired into the food provided to the boys and found that for a special reason the food was cooked in metal containers provided with a lid which was screwed down during the process of cooking. The food was therefore subjected to a process of autoclaving which is now known to destroy vitamin A. Dr. Findlay recommended a supply of cod-liver oil and swede juice, and the disease disappeared. I am greatly indebted to Dr. Findlay for allowing me to make use of this important and hitherto unpublished information.

There may be other conditions of malnutrition, especially in children, in which a deficiency of vitamins may prove to be an important ætiological factor. But it is not my intention to-night to discuss what diseases may, or may not be, due to vitamins. The fact that specific diseases can be produced by the absence of specific vitamins and can be cured as by magic by supplying the missing vitamins is striking and impressive. But this very impressiveness has obscured other phenomena related to the vitamins which, though less obvious and less striking, are of at least equal practical importance. I refer to what, for want of a better name, I have called the effects of "vitamin underfeeding." This may produce conditions of obscure ill-health, or it may not go as far as that, merely leading to an imperfect development of the organism, to deviations from the optimum which cannot even be called deviations from the normal. These effects are so little obvious that they have up to now been overlooked; in fact, according to the current conception of vitamins, they should not occur at all.

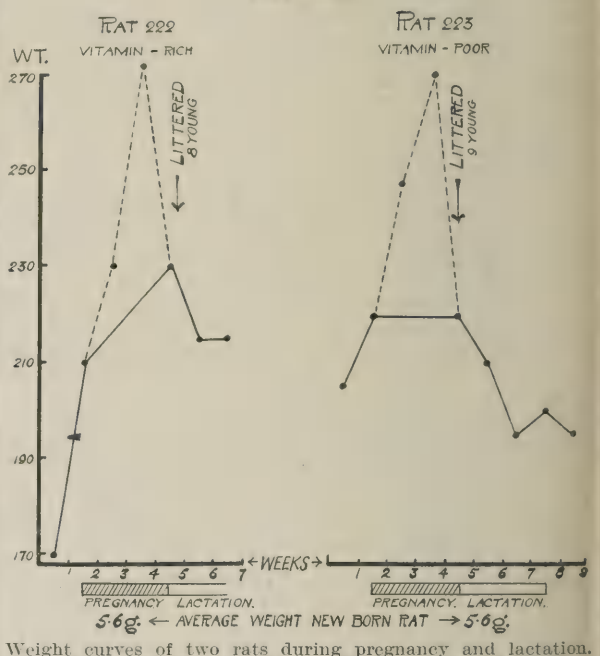
The following considerations will, perhaps, make my point clear. As a rule, we think of disease as an event superimposed upon the healthy organism. In such diseases as cholera, measles, syphilis, influenza, whooping-cough, diphtheria, and in fact all infectious diseases, we date the disease from the moment when infection occurred, even although the symptoms may not make their appearance for several days or weeks. There is a sharp dividing line between health and disease in these cases. Even in such a disease as cancer we date, mentally at any rate, the onset of the disease from the moment that a cell or a group of cells has acquired the property of autonomous growth which is the outstanding characteristic of a cancer cell. But in other groups of diseases it is impossible to date the onset of the disease. In such conditions as, for instance, myxœdema, Addison's disease, diabetes mellitus, acromegaly, it is, as a rule, impossible to draw even mentally a dividing line which would separate sharply a subnormal functioning of an endocrine organ from the actual disease. There is a borderland between health and disease when we consider the functional activity of the endocrine organs, and there is such a borderland also when we consider vitamins.

Animal Experiments on Vitamin Underfeeding: Evidence of Imperfect Development.

Experiments on animals have demonstrated that a highly differentiated organism requires for its full development a *maximum* supply of vitamins especially during the early period of its life. Any restriction of this supply leads to an imperfect development without necessarily producing obvious disease or obvious ill-health and without even preventing the process of reproduction. The result is an undersized, ill-bred population with a diminished resistance to disease—a "C 3" population. And I wish to stress this point: These results were obtained not with an artificial diet specially constructed with the intention of restricting the vitamin-supply but with a natural diet of bread and water, maize and rice, which was fixed upon empirically many years ago, after a good deal of experience, because it enabled this laboratory to maintain and rear a large population of rats economically and efficiently for experiments in connexion with cancer. Such experiments are of long duration, and it is essential for their success that spontaneous diseases and epidemics should not intervene. Fresh greenstuff was intentionally excluded from the diet, because it was found to give rise to epidemic outbreaks of enteritis.

From the practical point of view the diet appeared, therefore, to be adequate. In the light of our present knowledge it is clear, however, that its content in vitamins is restricted. It is also defective in respect of the proportion in which the inorganic elements are present. The diet contains little calcium and a preponderance of the acid-forming elements. Neither of these defects are sufficiently severe, however, to produce obvious ill-health or to interfere with the breeding and rearing of the stock. When this diet was supplemented by the addition of small amounts of preparations rich in vitamins, such as cod-liver oil for vitamin A and a yeast preparation for vitamin B, the stock improved markedly as indicated by a more rapid growth. This was especially striking when the pregnant and lactating mother was kept on the vitamin-rich diet. So far as the mother was concerned there was always a loss in weight of the mother during the period of pregnancy and lactation on the vitamin restricted laboratory diet alone, while with the addition of vitamins the mother actually gained in weight in most cases and never showed a loss (see Chart A). This means that on the vitamin-restricted diet the mother had to sacrifice her own tissues in order to nourish her offspring. The weight at birth of the litter on the whole was not smaller on the vitamin-restricted diet, but was actually larger.[3] The growth of the embryos in utero was, therefore, quite unaffected by the vitamin-supply. But as soon as the animals are born and become dependent upon the functional activity of the alimentary canal, the difference between the two diets becomes apparent. Not only the increase in weight and size, but also development, such as the growth of the fur, is more rapid on the diet supplemented with

Chart A.



Weight curves of two rats during pregnancy and lactation. Rat 223 was on the ordinary laboratory diet and therefore vitamin underfed. Rat 222 received the same diet supplemented with cod-liver oil and marmite. The broken line indicates the increase in weight during pregnancy due to the development of the embryos in utero. Note the pronounced loss of weight of the vitamin underfed rat during lactation.

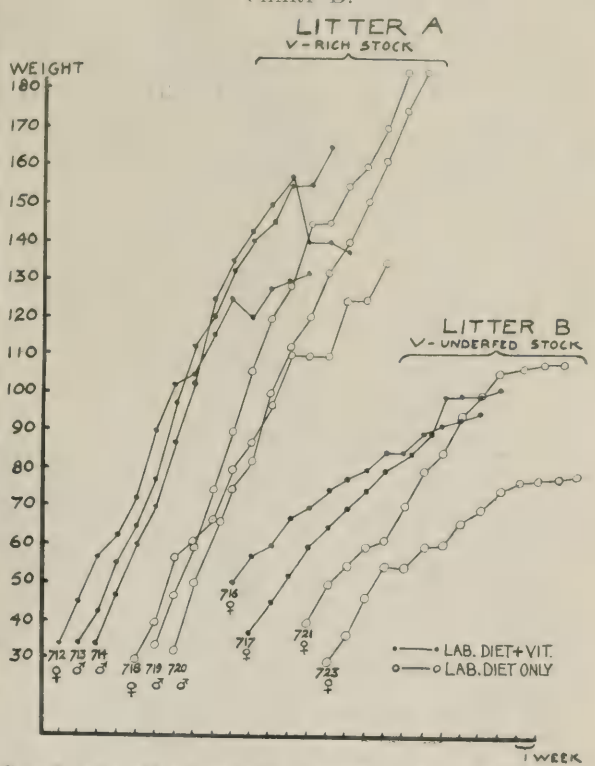
[3] Full data of these experiments have been given in a previous paper "On Vitamin Underfeeding," Brit. Jour. Exp. Path., 1922, iii., 298.

cod-liver oil and yeast. This difference persists and becomes more marked when after weaning the difference in the two diets is maintained.

We have now for nearly three years kept two stocks of rats on these two diets. The stock kept on the laboratory diet alone is called the "vitamin-underfed stock." In order to demonstrate this difference I have brought here two litters of the same age from these two stocks. These rats are now five months old, are sexually mature, and have passed the period of most active growth. The rats from the underfed stock are obviously undersized, but otherwise look normal, healthy animals. If one did not know their age one would from their weight and size take them to be much younger animals of the vitamin-rich stock. But there is a much more important and significant difference between the animals from these two stocks than mere difference in weight and size. This difference, which affects the whole make-up of the animal, manifests itself in different ways. For instance, when young rats from the vitamin-underfed stock are placed on a diet free from vitamin A their growth stops at once; within 8–10 weeks at the latest they develop the typical eye lesion and look ill and emaciated and die from some infective condition. The rats from the vitamin-rich stock continue to grow for a considerable time. Their growth may sometimes be more rapid than that of rats kept on the ordinary diet. For three or four months they look perfectly well and healthy, and the typical eye lesion develops two or three months after the death of the rats from the vitamin-underfed stock. I have maintained two rats on a completely vitamin-free diet for nine months before the eye lesion developed. These differences are obtained invariably and have been confirmed by other observers.

But this difference between the vitamin-rich and the vitamin-underfed stock manifests itself even when there is no attempt to produce a deficiency disease. When the diet of rats from a vitamin-underfed stock is supplemented with an ample supply of vitamins their growth may be a little improved, but it is not as rapid as the growth of the animals from the vitamin-rich stock. They never catch up in weight and size with the animals from the vitamin-rich stock. In a paper published a year ago I have given the chart of such an experiment.[4] But sometimes the growth is not improved at all. Conversely when rats from a vitamin-rich stock are subjected to vitamin underfeeding their growth is only slightly impaired and sometimes is not impaired at all. Results of this kind cannot be explained by assuming that this vitamin-rich stock has in its tissues a store of vitamins on which the animals can draw. In Chart B the result of another such experiment is given. It refers to two litters of known and equal age: Litter A from a vitamin-rich stock, litter B from a vitamin-underfed stock. When seven weeks old three rats of litter A were placed on the laboratory diet enriched with cod-liver oil and marmite. Similarly, three rats of litter B from the vitamin-underfed stock were placed on the vitamin-rich diet, while the other three rats were kept on the laboratory diet alone. Two rats died at the beginning of the experiment from lung infections and are not represented in the diagram. It will be seen from Chart B that in this experiment the growth of rats which came from a vitamin-rich stock and which since birth had received an ample supply of vitamins was not impaired by subsequent underfeeding of vitamins. Conversely, rats which came from a vitamin-underfed stock and for the first seven weeks after birth had been subjected to vitamin underfeeding, were not able to respond to an increased vitamin-supply by increased growth. They had received permanent damage as the result of the unfavourable dietetic conditions to which they had been subjected. Since rats of litter B come from a stock which had been subjected to vitamin underfeeding for several generations, we cannot differentiate between the effects of this underfeeding on the litter itself and on the previous generations. There is considerable evidence from the work of other workers, especially Orbone and Mendel, and McCollum and his collaborators, that defective nutrition has remote effects with cumulative action through successive generations, so that the physical condition of the stock becomes progressively worse. To simplify the argument we describe this experiment as underfeeding of litter B. But the possibility that the condition of this litter is due partly to the underfeeding practised

CHART B.



Growth curves of two litters A and B of equal age. For further explanation see text.

on preceding generations adds further emphasis to the danger of vitamin underfeeding. Definite functional and anatomical differences can be noticed between certain corresponding organs and tissues of these two stocks. The lymphoid tissue of the vitamin-rich stock is functionally and anatomically more fully developed, and this is reflected by an increase in the number of lymphocytes in the circulating blood. The same holds good for the intestinal mucous membrane; in fact, in the vitamin-poor stock definite atrophic changes may sometimes be seen in the intestinal mucosa. In order to compare periods in the life of a rat with periods in the life of man it is necessary to multiply the former by about 20 times. Donaldson, in his book on the rat, gives an even higher figure (30 times). The length of life of a rat is three to four years and it is sexually mature after five to six months. The first four weeks in the life of a rat correspond therefore to the first two or three years in the life of a child. And underfeeding practised in a stock of rats for three years involves four to five generations.

MODE OF ACTION OF VITAMINS.

The significance of these observations is bound up with the problem of the mode of action of vitamins. The first investigators of the conditions produced by the complete absence of vitamins noticed no specific pathological lesions, and believed that the decline in health of the animal was due to a general decline of all its cells. The generalisation was formulated that all cells require a small amount of vitamins for their life and growth. If this amount is supplied the animal is held to be in normal health and to store

[4] THE LANCET, 1923, i., 1046.

the excess in its tissues. If less than the required amount of vitamins is supplied the health of the animal declines unless it has a store of vitamins in its tissues on which it is supposed it can draw. As already stated, the vitamins are supposed to have no positive physiological action of their own. The organism is regarded as a test-tube in which the cells of the organism are titrated against vitamins. If the quantitative relationship between these two reaches a certain proportion we have growth and health; if it falls below that—no growth and disease.

I have repeatedly criticised this view and pointed out that this conception is based on assumptions which do not agree with observed facts. Isolated cells can grow and live without vitamins, although a highly differentiated organism as a whole cannot. Vitamins have a positive physiological action corresponding to the action of hormones. There are specific pathological lesions produced when vitamins are withheld from the food, and these lesions account for the onset of the specific deficiency disease.

To take the last point first. In the absence of vitamin B there is invariably an anatomical and functional atrophy of the lymphoid tissue throughout the body, which is reflected in the circulating blood by a lymphopenia. In the absence of vitamin A there is an atrophy of the intestinal mucous membrane. There is a similar atrophy of one of the paraocular glands and also a great reduction in the number of blood platelets. Dr. R. G. Bannerman has informed me that he has been able to confirm this thrombopenia in rats kept on a diet free from vitamin A. These lesions account for the specific diseases produced by the absence of the two vitamins. If the atrophy of the lymphoid tissue is produced by some agency other than the deficiency of vitamin B, for instance, by exposure to radium, we get the same condition of marasmus that is characteristic of vitamin-B deficiency. In a paper published by Drew, Mottram, and myself in 1921, entitled "On the Function of the Lymphocyte and of Lymphoid Tissue in Nutrition," it was pointed out [5] that human pathology furnishes further evidence in support of the intimate relation of the lymphoid tissue to nutrition. The blood of infants and children contains four to five times the number of lymphocytes present in the blood of the adult. Disturbances of the adenoid tissue are of special significance in childhood and are known to be frequently associated with disturbances in nutrition. There are in infants extreme disturbances of nutrition which cannot be ascribed to neglect or deficient feeding. In such cases of marasmus, atrophy of the lymphoid tissue —thymus, spleen, Peyer's patches—are the main lesions found. An important function of the lymphoid tissue is, therefore, to maintain the nutrition of the body—a view which is also held by the French physiologist, Jolly, on similar grounds. An interesting confirmation of this view has been adduced quite recently by Carrel,[6] who, I regret to say, has not seen fit to acknowledge our work, from his observations on the cultivation of fibroblasts in vitro. He finds that these cells can only grow in serum when lymphocytes are added to it and argues from this that the lymphocytes synthetise from the serum substances necessary for growth. The condition produced by vitamin A deficiency is less well defined; it may be described as a condition beginning with vague ill-health and malnutrition which finally culminates in the onset of bacterial infections of an avirulent type affecting especially the eyes and the lymph glands in the neck. Frequently there is also an anæmia. A glance at Fig. 1, which represents two villi in the lower end of the small intestine stained for bacteria by Murray's Nile blue–Van Gieson method, shows how such a condition arises as the result of the pathological changes in the intestinal mucous membrane. The villi are not only atrophic as shown in figures published in a previous paper and have in part lost their epithelial covering, but the bacteria which in a normal animal are confined to the centre of the lumen of the intestine penetrate down between the villi and into the remotest recesses of the Lieberkühn's crypts. The mucous glands of the cæcum present a similar penetration by bacteria. A similar condition is produced by exposure to radium, as Mottram has shown. The effect of radium is established more rapidly and by following the changes Mottram [7] has been able to show that the primary effect is on the secretion of mucus at first. The mucin secreting cells increase in number and this is followed by atrophy. A similar change is visible in the intestinal mucous membrane of rats kept on diet free from the fat-soluble vitamin, but owing to the more chronic nature of the change, which may extend over several months, the sequence of this change is not so clear. In some parts the number of mucous cells is increased, but the cells are large and empty, with a wide opening towards the intestinal lumen. Bacteria may sometimes be seen in the empty vacuole. In other parts there may be a remarkable absence of mucin secreting cells. In a previous paper [8] I have given the figure of a mucous gland of the cæcum distended with bacteria. Reference to that figure will show a complete absence of mucous secreting cells. The necrotic and atrophic changes affecting the villi and the invasion of bacteria are probably the result of this primary effect on the secretion of mucus which has a protective action. The typical eye infection which is the most obvious sign of vitamin A deficiency can be explained in the same way. For Yudkin and Lambert have demonstrated profound atrophic changes in one of the paraocular glands—the Harderian gland. This gland resembles a mucous gland and has been described as such. These specific atrophic conditions disappear quickly when the specific vitamins are fed to the animals. Thus vitamin B stimulates the lymphoid tissue which rapidly regains its volume and functional activity so that the number of lymphocytes increases in the blood. Similarly the atrophy of the intestinal mucous membrane disappears when vitamin A is given, the blood-platelets rapidly increase, and the infections disappear.

This is in itself indication of a positive stimulating effect of the vitamins. But such an effect can be demonstrated not only in animals suffering from a vitamin deficiency but also in perfectly normal animals. Mottram, Drew, and I have shown that the absorption of food as indicated by the absorption of fat is greatly affected by the presence of vitamins. And Uhlmann, Voegtlin and Myers, Drummond and Anrep found that extracts of certain foods rich in vitamins when injected into the blood stimulate the pancreas to secrete. It is curious that this very significant fact has not received the attention which it deserves, presumably because it did not fit in with the current conception of the mode of action of vitamins. Another fact of considerable practical interest is the powerful stimulating effect on the appetite exerted by vitamin B, so that when this vitamin is absent from the food the appetite at once falls. All these observations taken together lead naturally to the conclusion that *vitamins are hormone-like substances present in the food.* They have a specific stimulating action on certain tissues, and these tissues themselves are dependent for their normal functional activity on the continued stimulation by these substances, in the same way as, for instance, the uterus is dependent on the ovarian hormone. We may describe, therefore, the vitamins as "food hormones," or "trophacoids," if we adopt Schäfer's nomenclature of calling the internal secretions "autacoids." And if we recall what tissues are dependent in this way on a continued extraneous supply of hormones in the food we find that they are mainly, though not exclusively, those which are concerned with the digestion, absorption, and assimilation of food—a very natural relationship.

[5] THE LANCET, 1921, ii., 1202.
[6] Journal Exper. Medicine, 1923, xxxviii., 513.
[7] Proc. Roy. Soc. of Medicine, Section of Electrotherapeutics, 1923, xvi.
[8] THE LANCET, 1923, i., 1046.

It is a very curious fact, too, that many of the tissues which are thus particularly sensitive to the extraneous agency of food hormones are sensitive also to another and quite different extraneous agency —namely, radiation. Exposure to radium will produce the same atrophic lesions and the same general effects as a deficiency in vitamins. Very small doses of these radiations produce a stimulating effect and there is an increase in the number of both lymphocytes and platelets. Another kind of radiation, light, has also a stimulating effect on the platelets and this may be the explanation of the curious fact that exposure to ultra-violet light delays the decline of an animal kept on a diet free from vitamin A. It has been said that it is difficult to understand on biochemical grounds how a physical agent such as light can take the place of an article of diet. It is, indeed, difficult, if we look upon a living highly differentiated organism as a test-tube in which quantitative chemical relationships exist between the cells and vitamins; and the only explanation which has been given on the basis of the chemical conception is that rats that receive light use vitamin A more economically. But from the biological point of view there is no difficulty in understanding that different stimuli —chemical, mechanical, electrical — when applied to living protoplasm produce the same effect. Light, however, does not have a stimulating effect on the intestinal epithelium or on the paraocular glands—at least in the doses which we have applied — and therefore the atrophic changes in these tissues due to the absence of the fat-soluble food hormone are not counteracted. It is interesting to remember that vitamin A is formed by plants in the presence of light. The more highly differentiated forms of animal life are not dependent for the maintenance of their functions on light to the same extent as plants, although light is still capable of stimulating the functional activities of some of their cells. The higher forms of animal life have instead become dependent for their well-being on the supply of a chemical substance for the formation of which light is necessary.

FIG. 1.

Lower end of small intestine of rat kept on a vitamin A free diet for seven weeks when the eye affection supervened. The animal was killed. Formol saline × 440. Stained with Nile blue–Van Gieson for bacteria. The bacteria have penetrated between the villi and into the Lieberkühn crypts. Note also the peculiar condition of the mucous cells.

THERAPEUTIC APPLICATION OF VITAMINS.

The significance of the conception of vitamins as food hormones from the point of view of evolution is obvious. Of more immediate practical application is the consideration that the need for these food hormones is greatest immediately after birth and in the first few years of life when the organism is adapting itself to a new environment and when the tissues which are stimulated functionally by the food hormones assume their functions. It is obvious also that this conception has a therapeutic application not confined to the deficiency diseases. We possess in these food hormones valuable drugs with a specific action. As a matter of fact, yeast had been used empirically, long before the existence of vitamins was known, as a remedy for two minor complaints, boils and constipation. Quite recently the use of yeast as a remedy for constipation has again been tested very carefully by Murlin,[9] and its value has been confirmed, and Gross has demonstrated the same for marmite, a yeast preparation rich in the water-soluble B.[10] We have seen that this food hormone stimulates the lymphoid tissue and this is probably the explanation of its usefulness in furunculosis. We have also seen that it affects favourably the processes of digestion and absorption in the intestinal canal, which would account for its use in relieving constipation. The constipating effect of the absence of vitamin B seems to be due to retention of the fæces in the large intestine and not to a general intestinal stasis, as has been stated, for unpublished observations by Dr. Mottram and myself showed that the passage of food through the small intestine is not delayed if vitamin B is absent. A direct result of this conception of food hormones has been the revival of their therapeutic application in certain forms of marasmus in infants not due to neglect or deficient feeding and therefore not due to a deficiency in vitamins. The functional atrophy of the lymphoid tissue and of the intestine, which is found post mortem in such cases, must therefore be regarded as a primary cause. It can be remedied by the active stimulation of these tissues by means of preparations richer in vitamins than milk. In practice it has been found that many cases of marasmus which have proved resistant to treatment by most careful feeding improve rapidly after the administration of cod-liver oil, malt, and orange juice. This is, in fact, an old empirical treatment which had fallen into disuse and which, during the last two years, has been applied again extensively. I am indebted for this information to Dr. D. Paterson, of the Hospital for Sick Children, Great Ormond-street.

[9] American Jour. of Physiology, 1923, lxiv.
[10] Journal of Pathology and Bacteriology, 1924, xxvii., 27.

From this conception of vitamins as food hormones it follows that their therapeutic application is not confined to the conditions which are caused by a deficiency in vitamins. Conversely, the fact that a vitamin relieves a disease does not necessarily prove that the disease was due to the deficiency in this particular vitamin. This consideration may help to clear up some difficulties and contradictions which have arisen. Thus the fact that cod-liver oil cures rickets does not necessarily prove that rickets is caused by a deficiency in any particular factor present in cod-liver oil. As a further example of the therapeutic value of these food hormones, the clinical observations by Hawk, Knowles, Rehfuss, and Clarke [11] may be mentioned. They studied the effect of a yeast preparation on a great number of different conditions such as furunculosis, acne, constipation, gastro-intestinal catarrh, &c. Seventy-six cases were treated, 66 improved or were cured, and apart from the improvement in the symptoms there was also a general improvement.

The therapeutic value of the fat-soluble food hormone is, of course, exemplified by the powerful therapeutic effect of cod-liver oil in a variety of different affections, especially infective conditions of a chronic kind such as tuberculosis. It may be that in these conditions this effect is partly related to its stimulating action in the formation of platelets. A good deal of experimental evidence, for which reference must be made to our previous papers, has accumulated recently which indicates that the platelets are a mechanism of defence against certain types of bacterial infections. It is suggestive that the two useful remedies in tuberculosis—cod-liver oil and light—both increase the number of platelets.[12]

But the most important therapeutic action of the fat-soluble trophacoid lies in its action on the intestinal mucous membrane. In a normally functioning intestine the bacterial and protozoal flora is confined to the centre of the intestine owing to the protective action of the mucus. Mr. C. J. Bond [13] has recently expressed the view based on experimental observations that mucus may play a biochemical as well as a mechanical part in the protection of mucous membranes against infection. When the normal functioning of the mucous secreting cells is impaired by a deficiency of vitamin A in the diet the bacteria and protozoa can be seen to attach themselves to the surface of the villi, to creep down between the villi into the crypts, and even into the atrophic mucous cells, and to proliferate there. In a previous paper I have given a drawing of a mucous gland of the cæcum distended with a mass of bacteria, and no mucous secreting cells are visible in that section. Cestodes also are present much more frequently in the intestine of rats kept on vitamin-deficient diets. As a rule, these bacteria and protozoa are of an avirulent type, and so the animal quickly recovers when vitamin A is administered in the form of cod-liver oil. But if the organism should be the carrier of a virulent bacterial or protozoal organism, then the conditions for an outbreak of a virulent specific infection are given. A very important experiment of this kind, carried out with monkeys, has been recorded by McCarrison,[14] who has also emphasised the importance of vitamins in the ætiology of gastro-intestinal disorders generally. The action of the fat-soluble food hormone on the mucous glands enables the intestine to keep in check its pathogenic inhabitants and thus confers protection against intestinal disease. And what applies to the intestine applies with equal force to the eyes. It is surely a suggestive fact that the two chief seats of disease in tropical countries, where the consumption of those articles of diet rich in vitamin A is necessarily restricted, are the eyes and the intestine.

[11] Journal American Medical Association, 1917, lxix., 1243.
[12] A striking clinical example of such a relationship has been published recently by R. G. Bannerman, Brit. Jour. Exp. Path., 1924, v., 16.
[13] Brit. Med. Jour., 1921, ii., 974.
[14] THE LANCET, 1922, i., 208.

PROBABLE VITAMIN UNDERFEEDING OF THE POORER CLASSES.

And now I come to what I believe is the most important aspect of vitamin dietetics. If we compare these apparently healthy but under-sized rats of litter B, in which out of six rats two rats kept in separate cages died from lung infections when they were only a few weeks old, with the big, well-developed animals of litter A, all of which survived, if we remember that both litters received the same basal diet and that the only difference was that the animals of litter A came from a stock which had received through several generations an additional supply of vitamins in the form of a yeast preparation and of cod-liver oil—and if we then consider the large number of under-sized, ill-developed children and adults that we can see any day in the streets of any big town, the question is forced upon us: Is this vitamin underfeeding—of which litter B is an example, and which has been going on in our laboratories quite unintentionally for many years, without any gross evidence of disease—going on on a large scale in our population? The main articles of diet for the poorer classes are bread, margarine and jam, meat and potatoes, and for the smaller children milk. The main supply of the water-soluble food hormone B ought to be bread, since whole-meal flour is abundant in this vitamin. But the white bread of to-day is poor in this vitamin, because as the result of the fine milling those parts of the wheat grain that contain this vitamin are eliminated. Bread used to be called "the staff of life," but that was a long time ago when whole-meal bread was used. Our bread of to-day had better be called "a broken reed." In the diet mentioned, potatoes are practically the only source of vitamin B—and they are not rich in this substance. The substitution of margarine for butter deprives us of the main supply of vitamin A. Many brands of margarine are completely free from this vitamin, some contain a small amount of vitamin A, but not as much as butter. There remains only milk as the remaining source of vitamins provided that whole milk is given and not milk that has been deprived partly or entirely of its fat, and thereby of vitamin A. And the boiling of the milk, which is rendered necessary in the present unsatisfactory state of the milk-supply in big towns, further reduces the amount of vitamins that may be present. It will be remembered that on a very similar diet in a Danish institution the outbreak of keratomalacia occurred which Bloch investigated. The well-to-do classes make up for this by a consumption of eggs, butter, green vegetables and salads, and fruit, all of which are rich in vitamins. I do not see how it can be denied that under present conditions of town life large classes of the population live on a diet which contains only a small fraction of the food hormones present in the food in its natural state. This defect in our diet has also been pointed out by McCarrison, and in America by Osborne. The prevalence of constipation is a good indicator of an underfeeding of the water-soluble food hormone. It was recognised long before we knew anything about vitamins that the use of white bread was responsible for constipation, and that the latter disappeared with the substitution of whole-meal bread for white bread. It was then believed that the presence of indigestible cellulose material in brown bread acted as a mechanical stimulus to the intestine. But since this constipation can also be remedied by giving vitamin B in the form of yeast, the cause of the constipation must be sought in underfeeding with vitamin B, and not in the absence of a mechanical stimulus. If we consider that bread ought to be the main supply of vitamin B in the diet it is startling to remember that an outbreak of beri-beri occurred among the British troops in Mesopotamia when they were living on rations of white bread and tinned meat.

We have seen that certain tissues or groups of cells are dependent for their full functional activity on the continued stimulation by the food hormones, that their activity declines as we diminish the supply of

these food hormones until we get atrophy with the prolonged complete absence of food hormones. There is no hard-and-fast line where disease begins and health ends, but a whole series of gradations of functional activity. The so-called deficiency diseases in their typical form represent merely the extreme end of this series. The intermediate stages of chronic vitamin underfeeding may manifest themselves only in a young organism by less rapid growth or not at all until the occurrence of incidental disease superimposes a new strain upon the organism. Thus, in our vitamin-underfed rats the lymphoid tissue and the intestinal mucosa are not as well developed as in the rats from the vitamin-rich stock; in fact, the intestinal mucosa frequently shows atrophic changes approaching those seen in vitamin A deficiency, and spontaneous lung affections are much more frequent than in the vitamin-rich stock. This difference refers to underfeeding in vitamin A and B, since rats are not dependent on a supply of vitamin C. Marshall Findlay[15] has induced a condition of "latent scurvy" in guinea-pigs by underfeeding them with vitamin C. Such animals present, like our rats, no obvious external signs of ill-health. Histological examination shows, however, that the blood-forming bone-marrow is atrophic, and when these animals are experimentally infected with pathogenic bacteria it is found that their resistance to such infection is greatly diminished. Some interesting clinical evidence bearing on this point has been recorded by Hess, of New York,[16] whose work on rickets is so well known. He observed in 1913 in a group of children which had been fed on pasteurised milk a widespread grippe infection with hæmorrhagic skin manifestations. He attributed this to a "scorbutic taint" in these children, and brought about a disappearance of these skin manifestations by the administration of orange juice. Hess also draws attention to the frequent coincidence of nasal diphtheria and what he calls "latent" scurvy. When a large number of cases of nasal diphtheria develop, suspicion should be aroused that the infection is implanted in tissues weakened by scorbutic or other nutritional disorders. He also quotes Davidsohn, who attributes the spread of tuberculosis in Central Europe during the war to a defective supply of vitamins.

Many clinicians have been sceptical about the importance of vitamins in the ætiology of disease, because typical deficiency diseases as they are induced in the laboratory experiments by complete deficiency of vitamins are a rare occurrence in our population though, as we have seen, they do occur), and because the complete absence of one or other vitamin from the food of people living on a mixed diet can only occur in exceptional circumstances. But what the clinicians are likely to meet with, according to the conception which I have laid before you, are the results not of an acute complete vitamin deficiency but of chronic vitamin underfeeding. On this point Hess's views are most instructive. From his clinical experience he urges clinicians to realise that—

> The harmful effects of food deficiencies should not be associated in our minds essentially or chiefly with specific diseases such as scurvy or rickets, but rather as disorders of nutrition, producing slight and manifold disturbances of function. It is probable that every organ or system in the body may be affected by faulty nutrition. For example, involvement of the eyes may lead to impaired vision or nightblindness; or, on the other hand, neuritis, cardiac enlargement, disturbances of the circulating system, atrophic disorders of the skin, nails or hair, caries of the teeth, or unaccountable lack of appetite and constipation may each in turn be the earliest symptom. A more careful inquiry into the dietary of patients will result in bringing to light many cases in which vague and ill-defined symptoms can be remedied simply by rendering the diet adequate."[17]

Before I conclude I wish to revert once more to an important point. It is the infant and the child and therefore also the pregnant and nursing mother who is particularly in need of an abundant supply of these food hormones. Experimentally, it is a well-established fact that the younger the animal the more rapidly does it succumb to a deficiency in vitamins. Clinically, the most obvious and typical results of vitamin deficiencies have been observed in children, and you will have noticed that most of the clinical evidence which I have presented to you refers to children. From our conception of the vitamins as food hormones it is easy to understand why that should be so. The alimentary canal does not begin its function until birth, and we know that it is a most vulnerable part of the infant's organism. Its functional development is moulded, so to speak, by the stimulation it receives through the food hormones. If their supply is restricted, the functional development will be impaired, and a lasting damage may be inflicted which cannot be made good by an ample supply of vitamins in later life.

That is the pessimistic view. But the optimist may point out in reply: If care is taken to ensure an abundant supply of vitamins to the pregnant and nursing mother and to the child in the first few years of its life a lasting benefit will be conferred upon the child. The intestine and the other tissues that are susceptible to the stimulus provided by the food hormones can thus and only thus attain their full functional activity. I do not wish to exaggerate the importance of vitamins. I do not wish to give the impression that they are a panacea for all ills, and that if we could only ensure an ample supply of vitamins to everybody we should all live happily ever after. It is, in fact, an essential part of my argument that the action of vitamins is not a vague general action on all cells, but an action circumscribed in the same sense that the action of a hormone is circumscribed. But I think the statement is justified that we have allowed our basal articles of food to be deprived of their vitamins, with the possible result that large classes of our population may be suffering from vitamin underfeeding, and living in the border-land between health and disease. If that is so, we are facing a big social problem. But, unlike many other problems of this kind, it is a problem scientifically circumscribed which will be remedied, as soon as its existence is generally recognised, by a demand for bread which contains an ample supply of vitamin B and for margarine with an ample supply of vitamin A, and by realising the importance of whole milk and the inadequacy of skimmed milk in the feeding of children.

EXPERIMENTS IN NOURISHMENT OF CHILDREN.

How big this problem is, to what extent of vitamin underfeeding our population is subjected, can only be determined by experiments on man on a large scale. An experiment of this kind has already been carried out in America in some of the board schools in Chicago, and has been reported on by Dr. Katharine Rich.[18] The experiment was carried out because the startling discovery was made that 53 per cent. of the children of 14 applying for employment certificates were from 7 per cent. to 21 per cent. below the average child of that age and when employed could not carry out their usual amount of work. This defective condition was found to be due to faulty nourishment and was remedied mainly by correcting the diet. By ensuring the consumption of an ample amount of milk, and by instruction on the value of personal hygiene and cleanliness, an average gain was recorded within less than a year of 121 per cent. in weight and 64 per cent. in height in excess of the usual gain. These observations, which were made on 500 children, were not expressly designed to test whether the defective physical condition of these children was due specifically to vitamin underfeeding. There may have been other dietetic errors which were also corrected by the increased consumption of milk. For the distribution of food hormones in the basal articles of

[15] Journal of Pathology and Bacteriology, 1923, xxvi., 1.
[16] Journal American Medical Association, 1921, lxxvi., 693.
[17] Ibid.
[18] Journal American Medical Association, 1920, lxxv., 226, 1492; 1921, lxxvi., 998.

our diet is such that a deficiency in vitamin is usually accompanied by other deficiencies. Milk is particularly rich in calcium salts, and margarine is poor not only in vitamins but also in calcium salts as compared with butter. It may, in fact, be taken as a practical guide that if a diet composed of natural basal articles of food contains an ample supply of vitamins it is correct also in other respects. It should always be remembered that to correct the deficiency of our diet in food hormones by the addition of cod-liver oil for the fat-soluble A and malt or a yeast preparation such as marmite for the water-soluble B is only a makeshift.

The great value of the Chicago experiment, in which the dietetic faults were corrected not by a free supply of milk but merely by instruction and supervision, consists in having shown that such an experiment is practicable, inexpensive, and successful beyond expectation. From what has been pointed out in this paper, it would be even better to begin with the beginning, and in selected groups of families who are at present living in a condition of vitamin underfeeding to carry out an experiment of this kind on the pregnant and nursing mothers and on the children in the first years of life.

A COMMUNICATION BETWEEN THE VAGUS AND THE CERVICAL SYMPATHETIC,

WITH ITS CLINICAL ASPECTS.

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THE recent operations performed by Jonnesco for the treatment of angina pectoris, in which he extirpates the middle and inferior cervical sympathetic ganglia, directs attention to the anatomical communications of these structures. It is the primary object of this paper to describe some of these connexions which pass between the inferior and middle cervical sympathetic ganglia and the vagus nerve with its branch, the recurrent laryngeal—including their detailed distribution, which appear to have hitherto escaped particular notice—and secondarily to draw attention to the clinical aspects of these associations.

Anatomy.

Examination of the connexions of the inferior cervical ganglion on various occasions showed that a direct nervous link was frequently present between the right vagus and this structure, and in addition there was sometimes seen to be a communication between the middle cervical ganglion and the vagus. In the literature dealing with these parts no mention is made of any such direct link between vagus and sympathetic, although Cunningham describes the connexion between the recurrent laryngeal and the third cervical ganglion. Swan's work on the "Nerves of the Human Body" contains a plate illustrating a nerve joining the right vagus below the origin of the recurrent laryngeal, which appears to arise from the loop between the second and third cervical ganglia, but he gives no description of it. Twenty-five bodies, including three fœtuses, were examined for communications between the vagus and inferior cervical ganglion, which resulted in its presence being confirmed in 14 of the adult bodies, and in all three fœtuses—that is, in 68 per cent. of the specimens investigated. With regard to this percentage, it must be mentioned that the adult bodies were being dissected by students, which necessitated waiting for the removal of the lungs and the deep dissection of the neck before one could examine the region in question, a factor which might contribute to the number of negative instances, since this communication is almost invariably torn away if the mediastinal pleura near the apex be roughly removed. In this respect it is noteworthy that it was found in all three fœtuses.

The Relations of Vagus and Cervical Sympathetic.

The nerve passes from the inferior cervical sympathetic ganglion downwards, inwards and forwards to the right vagus just below the point where that nerve crosses the first part of the right subclavian artery; it is therefore lying in a very oblique plane in relation to the inner side of the pulmonary apex, amidst the subpleural connective tissue. At its sympathetic extremity it is closely related to the brachial division of the first dorsal nerve and the first rib; passing downwards beneath the subclavian artery it is in juxtaposition to the loop between the inferior and middle cervical ganglia. Close to its inner side is the branch from the inferior cervical ganglion to the deep cardiac plexus, and often several sympathetic filaments to the œsophagus and trachea. The general anatomical relations of this nerve will be seen in Fig. 1, which shows one of the fœtal dissections.

FIG. 1.

General anatomical relations of cervical sympathetic, from a fœtal dissection. The vagus, the sympathetic, and the communicating nerve are painted white; the nails are inserted in the severed ends of the right common carotid and right subclavian arteries respectively. The phrenic nerve is seen crossing the pericardial sac. The recurrent laryngeal passed inwards in contact with the under-surface of the subclavian artery at the point of junction of the communicating branch with the vagus; consequently it is not shown.

Preliminary to describing the detailed connexions of the vagal extremity, it is opportune to mention the method by which these were traced. The vagus and sympathetic and their communication in this region were removed en masse, and dissected under water with the aid of a lens; in this way it was easy to trace the largest fasciculi, and possible to follow them still further with the aid of transmitted light, dissecting across the aperture of a shaded electric lantern. The application of a fat solvent was also found to be useful; for this purpose benzine was swabbed over the fibres, which freed them from adherent fatty tissue, revealing the sharp outline of the nerve.

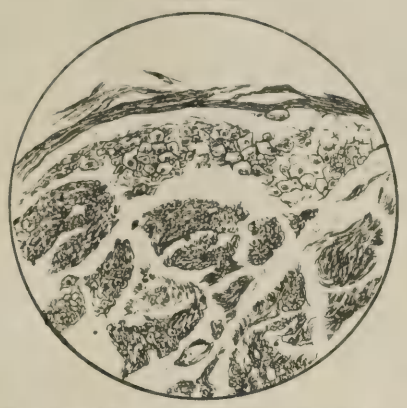
In describing the detailed connexions of this vago-sympathetic communication, it will be advisable to consider the two sides separately on account of the difference presented; further, it may here be remarked that although the communication to be most particularly described passes from the inferior cervical sympathetic ganglion, there was noted in several of the specimens examined a similar link with the vagus proceeding from the middle cervical sympathetic ganglion; the connexion of the former nerve will be detailed first on the right side.

Sympathetic Extremity.—The origin of this communicating nerve from the inferior cervical ganglion was generally found to consist of two small branches, given off from the ventral surface of the ganglion, which immediately united to form the nervous link. Though this description is generally applicable, a

variation in the mode of origin was observed. In two of the specimens examined the nerve had an additional root from the cervical sympathetic chain which separated from that structure at a distance of about one inch above the inferior cervical ganglion; there were also the usual two roots from the latter which, after uniting, passed forward to join the third root and form the characteristic vagal connexion.

Vagal Extremity.—This end of the nerve usually presents a scheme of subdivision that may be accepted as characteristic of the structure—namely, a Y-shaped division—one portion passing downwards to the vagus, and the other entering the recurrent laryngeal a few millimetres from where the latter leaves the vagus. As a variation of this almost constant distribution, it was occasionally noted that the communicating nerve proceeded to the precise point of origin of the recurrent laryngeal, in which case the Y division was absent, whilst in one specimen the nerve joined the recurrent laryngeal about one inch from the origin of the latter from the vagus.

FIG. 2.



Drawing from microphotograph, showing large medullated fibres principally concentrated in a small bundle on the periphery of the nerve, a few being also scattered about the bundles.

Distribution.—This may be most readily followed with the aid of the diagrammatic representation (Fig. 5). Here the inferior of the two main divisions entered the lower border of the vagus, wherein many of its fibres could be traced as far as the branches to the deep cardiac plexus. The other principal division entered the recurrent laryngeal a few millimetres from its commencement. Herein it underwent a distribution such that the part proceeded peripherally (*e*) in the recurrent nerve; the remainder ascended to the vagus and divided into ascending and descending branches. The latter (*g*) could be distinctly traced into the centre of the vagus, which point is emphasised to show that the fibres are not merely adherent to the surface of that nerve, but definitely incorporated therein, a fact which was also definitely shown by histological examination, to be referred to later. These caudal fibres were traceable as far as the plexus gulæ, but no filaments appeared to emanate in the direction of the cardiac or pulmonary plexus. The cranially directed division also passed into the interior of the vagus, but was lost after tracing it about one inch, the fibres becoming intimately intermingled with those of the vagus. As a slight variation to this distribution the specimens which showed a three-fold sympathetic origin on approaching the recurrent laryngeal about an inch from the latter's origin, gave an accession of fibres to that nerve by a separate branch, the fibres of which passed in a peripheral direction. It then adhered to the recurrent nerve, many of its remaining fibres passing on in a distinct cardiac branch, while the others appeared to decussate with the recurrent fibres and ascend to the vagus.

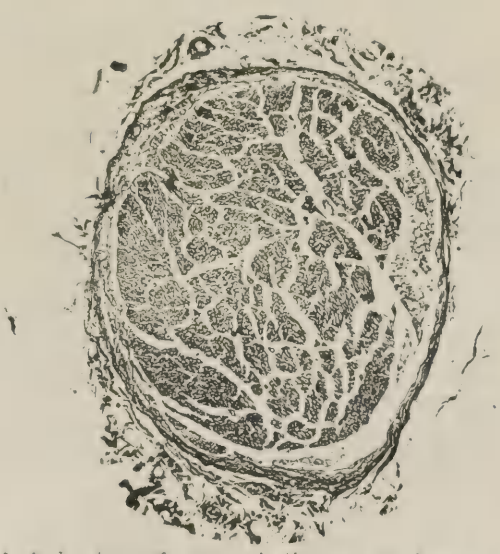
Left Side of the Body.—The anatomical connexions between the vagus and the sympathetic differ somewhat from those above described; in only one of the dissections was there any trace of a direct vago-sympathetic connexion, and this was in a fœtus. In this sole occurrence the distribution was precisely similar to that found on the right side; the branch from the inferior cervical ganglion having the same dual origin, and was distributed on reaching the vagus in the characteristic Y-shaped manner, some of the fibres ascending and others descending, the only exception being the absence of a branch to the recurrent laryngeal. In many of the remaining specimens examined the place of the communicating branch would appear to be taken by several large fasciculi, which passed from the third cervical ganglion to join the recurrent laryngeal. This arrangement was met with in ten adult bodies examined, but in six others the branches from the inferior cervical ganglion were found to pass independently to the deep cardiac plexus.

Distribution of Branches.—Dissections of these recurrent sympathetic communicating nerves demonstrated that on joining the laryngeal nerve their fibres are distributed in both directions, some

FIG. 3.

Funicular type of communicating nerve surrounded by loose connective tissue, containing small blood-vessels, which form the epineural sheath; internal to this is the nerve proper, subdivided into funicular bundles, each surrounded by a definite perineural sheath of fibrous tissue.

FIG. 4.

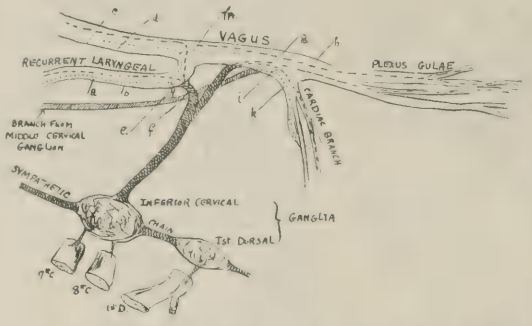


Non-funicular type of communicating nerve, showing loose epineural tissue surrounding a single perineural sheath, enclosing the entire nerve, the fibres of which are segregated into bundles, only separated by a very scanty endoneural tissue.

ascending towards the larynx; others descending in this nerve appeared to leave it mainly by several branches to the aortic and deep cardiac plexus, at the point where the recurrent laryngeal passes behind the arch of the aorta in close relationship with the commencement of the left bronchus (Fig. 6). The descending fibres are shown by the interrupted line *a*; it was thought that in the specimens dissected some of the fibres continued beyond the origin of the cardio-aortic branches to ascend to the vagus trunk, but with regard to this point one cannot speak with certainty, although such a distribution is to be expected from the analogy of the right side and from comparison with the one example of a direct vago-sympathetic link on the left side. The presumed course of such fibres is into the deep cardiac branches of the vagus, whilst others appeared to be merely adherent to that nerve and to separate from it with the cardiac filaments. On the left side of the body this middle cervico-vagal communication was also represented. It was present both in the dissection which revealed the direct vago-sympathetic link, and in those where the connexion was established with the recurrent laryngeal. This nerve was quite independent of the middle cardiac branch from the ganglion, and as shown in Fig. 6 by the line H.

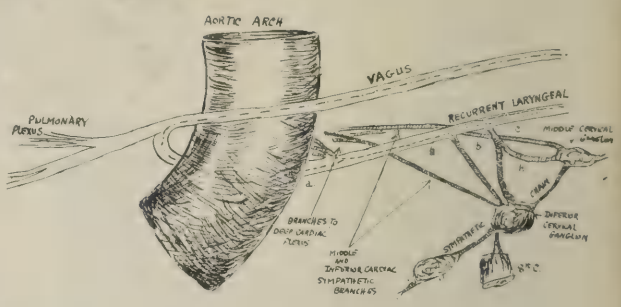
Distribution on Left Side.—A closer examination proved this to follow the usual bifurcate arrangement, branches both ascending and descending in the recurrent laryngeal.

FIG. 5.



(*a*) Fibres from middle cervical communication passing peripherally in the recurrent nerve. (*b*) Fibres from inferior cervical communication passing in same direction as above. (*c*) Fibres ascending in vagus from inferior communication. (*d*) The same from the middle communication. (*e*) Branch of middle cervical link to the recurrent laryngeal. (*f*) Branch of same to vagus. (*g*) Fibres from inferior communication descending the vagus. (*h*) Thoracic cardiac branches of vagus. (*i*) Fibres from inferior communication passing into cardiac branches of vagus. (*k*) Same from the middle communication. (*m*) Fibres descending in the vagus from the middle and inferior communications via the recurrent nerve.

FIG. 6.



(*a*) Fibres passing down the recurrent nerve from the inferior and middle communications. (*b*) Inferior cervical sympathetic communications to the recurrent laryngeal nerve. (*c*) Peripheral fibres in the recurrent nerve from the inferior and middle sympathetic communication. (*d*) Fibres ascending from recurrent nerve to the vagus. (*h*) Middle cervico-laryngeal communication.

shown by the line *d*. H is the middle cervico-laryngeal communication quite independent of the middle cardiac branch from the ganglion.

Middle Cervical Ganglionic Branch.

Besides these connexions between the inferior cervical ganglion and the vagus the presence of another sympathetic link with that nerve from the middle cervical ganglion was noted in several instances. Following the previous plan, the right side may be described first. The nerve was observed in eight of the 25 specimens examined. Its general relations are practically those of the communication just described, running obliquely downwards, inwards, and slightly forwards beneath the first part of the right subclavian artery in close relationship with its vertebral branch, the vagal link with the inferior ganglion, and also with the annulus of Vieussens.

Vagal Connexions.—This nerve was seen either to join the recurrent laryngeal or to divide, one portion going to the last-named nerve, the remainder to the vagus.

Intraneural Distribution.—The details of the distribution of these branches within the vagus and recurrent laryngeal will be more readily appreciated from a study of the diagram (Fig. 5), where the detailed connexions will be observed to be very similar to those of the branch from the inferior ganglion. The twig to the recurrent laryngeal (*e*) divides on entering that nerve, one portion of the fibres passing in a peripheral direction, the remainder are centripetal in their course. The latter on reaching the vagus subdivide into cranial and caudal divisions (*d* and *m*). This manner of distribution was found in both types above mentioned, although as an addition in the second type the principal accession of fibres was to the vagus below the junction of the inferior cervical ganglionic branch. These fibres (K) were traceable

Having discussed these vago-sympathetic communications from the purely anatomical aspect, one must attempt an elucidation of their physiological function in order to interpret their clinical significance.

Histology.

General Structure.—The general construction of this nerve in man appears to follow two definite formations depending on the presence or absence of funiculi; the usual construction is the funicular type seen in most nerves (see Fig. 3). In contrast to this formation is the appearance presented by the non-funicular type (see Fig. 4), where the loose epineural tissue surrounds a single perineural sheath enclosing the entire nerve, the fibres of which are segregated into bundles, only separated by a very scanty endoneural tissue.

Detailed Structure.—Turning to the detailed structure, the non-funicular nerve contained the two general types of fibres, the myelinated and non-myelinated; although there are many small groups of the latter type evenly distributed throughout the bundle, there appeared to be a general preponderance of the myelinated type, which, according to their relative size, may be classified into three main groups. It should, however, be remembered that although the extremes of these groups are distinct from each other, there are intermediate sizes which render this classification very wide. The smallest type of myelinated fibres, as measured by a micrometer eyepiece, were from 1 to 3 μ in diameter; these are distributed generally over the funiculus, and are distinctly the most numerous of their class. They may be compared to the small vagal medullated fibres which convey inhibitory impulses, and in this respect, also, to the similar splanchnic fibres. The next in frequency are the medium-sized medullated fibres which vary in diameter from 6 to 8 μ; like the former they are evenly

distributed amongst the fasciculi. Lastly, there is the group of large medullated fibres which have a diameter between 10 and 13 μ; these are distinctly the least numerous of the constituent elements. In the specimen described they were principally concentrated in a small bundle on the periphery of the nerve (see Fig. 2), whilst a few were scattered about the bundles; in all about 25 of these largest fibres could be distinctly counted. In their size they may be compared to the large vagal and large sympathetic fibres described by Gaskell and Edgeworth, although the fibres classified as medium-sized in the present example would more strictly compare with the large fibres of these investigators, the largest fibre in the human specimens considerably exceeding them. They are likewise strictly comparable with the large afferent sympathetic fibres of Langley, which he associates with the capsular end-organs. In the funicular type the same general division of the constituent elements pertains, but with this distinct difference—that there is a great preponderance of the medium-sized medullated fibres averaging from 5 to 6 μ in diameter, comparing with Edgeworth's large sympathetic fibres. The small myelinated and non-myelinated types are relatively scanty, whilst the largest medullated fibres in this specimen averaged 7 to 10 μ in diameter, and although mainly present in a small funiculus were more generally distributed than in the previous example, in this case 24 fibres could be distinguished with certainty. A section across the cervical sympathetic chain above the inferior ganglion showed no presence of the largest medullated fibres, the majority of the myelinated fibres were of the small variety, measuring about 1 to 3 μ, although one or two were from 4 to 5 μ in size, the remainder being of the non-myelinated type.

Turning to the inferior cervical ganglion, a longitudinal section of that structure, passing through the origin of the vagal communication and the lower end of the cervical sympathetic chain, revealed an interesting feature; numerous ganglion cells can be seen in the origin of the latter, whilst the commencement of the vagal communication is devoid of this feature. It will be recalled that whereas the non-medullated fibres are the post-ganglionic axons of the cells in the lateral sympathetic chain, the medullated fibres, on the other hand, make no synaptic connexions in these ganglia; hence the significance of the nerve cells continuing into the cervical sympathetic chain, which contained many more non-myelinated fibres than the vagal communication, where the other variety predominate.

The course of these large sympathetic fibres was still further defined by examination of sections across the vagus above and below its junction with the vago-sympathetic communication. Above the connexion no medullated fibres in the vagus were found to exceed 5 to 7 μ in diameter, whereas after the accession of the sympathetic nerve large medullated fibres of 10 μ diameter make their appearance scattered about the vagus. In both localities many non-myelinated and small and medium myelinated fibres are present, the smaller size of the latter type averaging about 1 to 2 μ.

All of this evidence tends the more fully to show that the distribution of these largest medullated sympathetic fibres in man compares almost precisely with the course of the similar large fibres in the dog as described by Edgeworth—with this difference, that the human example exceeds the other in average size, although 10 to 12 μ fibres of a similar nature have been found in animals, as described by Langley.

We may therefore conclude that the inferior cervico-vagal communication mediates both afferent and efferent impulses, and that in respect to the former it transmits a specialised type of fibre, the large myelinated variety, probably mediating afferent impulses from capsular end-organs, which structures, according to the cases examined, must be situated in the visceral distribution of the vagus.

Clinical Aspects.

From the clinical side it would appear that the importance of these vago-sympathetic fibres depends upon their two main spheres of distribution: (1) To the cardio-aortic region, and (2) to the thyroid gland. In the former association they mediate, at least in some cases, as shown by the success of Jonnesco's operation, the critical nervous impulses of angina pectoris, transmitting the afferent stimuli from the heart and aorta, and very probably transmitting efferent stimuli to that region. These nerves form a concentration point for the sympathetic cardiac fibres from the upper dorsal segments, and as such present a readily accessible isthmus at which to attack the vicious cycle of irritation by surgical methods. In the latter association these same communicating nerves probably mediate secreting fibres to the thyroid, and it is the pathological hyper-excitability of such fibres which may form a most important ætiological factor in the production of exophthalmic goitre; consequently, in suitable cases, in association with the other cervical sympathetic ganglia, their extirpation would appear to be justified in this disease as judged by the results of Jonnesco's work.

In conclusion, I must express my thanks to Prof. J. S. B. Stopford for his helpful criticism and for facilitating the work in many ways.

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THE MENTAL CONDITIONS FOUND IN CERTAIN SEXUAL OFFENDERS.

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IN this paper I have endeavoured to indicate the mental conditions which may be discovered in the intensive study of cases of two kinds of "sexual" offence—namely, indecent exposure and indecent assault. All persons accused of either of these offences are closely studied when received at this prison. The results which are briefly described here are those obtained by the examination of a series of 100 cases (50 cases of either offence). The majority of these were studied before conviction, a point of great importance which will be referred to again. Every case of these offences received here during a period of about three years has been included in the series, with 26 exceptions. These exceptions comprised 15 cases of indecent exposure and 11 cases of indecent assault, in which the accused persons consistently protested their innocence, asserting either that there was a mistake in identification, or, in the cases of charges of indecent exposure, that there had been no improper intention, the usual explanation being that they were urinating in some more or less public place, under the impression that there was no one to observe them. I have, consequently, included in my series only those cases in which the accused man frankly admitted his guilt.

Some of the omitted cases were ultimately found not guilty. I do not wish, in the least degree, to suggest that the remainder of the omitted cases were improperly convicted. There was often overwhelming evidence that the explanation given by the offender was untrue. But it is to be remembered that in these, more perhaps than in any other offences, there is need to consider the psychology of the witness as well as that of the accused. This point is often overlooked. The evidence in these cases is often that of

children or young girls. It is not likely that deliberate perjury or false accusation is common. But quite apart from these conditions there is much need for caution. The degree of memory and the type of memory varies greatly in different persons. And all who have studied children psychologically are well aware of their high degree of susceptibility to the influence of suggestion, their vivid imagination, and their habit of believing in the reality of their fantasies. And the desire to create a sensation, and to take the centre of the stage, must not be forgotten, both of these conditions having a psychological explanation. All this indicates the necessity for consideration of the psychology of the witness. It is true that the law most properly requires some corroboration of the testimony of a child. But in this particular type of case the fact of having complained without delay to a parent or some other person is often taken as sufficient corroboration.

Consideration of Proven Cases Only.

While this question of the value of evidence in criminal trials is of great interest psychologically, and of great importance practically, we are not directly concerned with it here. My desire has been simply to present a series of cases in which there could be no possible doubt that we were dealing, in every instance, with an actual case of the offence charged. This point is of importance. In other published studies of series of offences of various kinds there has often been a considerable element of doubt on this head. The conditions found in the omitted cases were just as varied as those found in the cases included in the series. And had the statistics of the omitted cases been included, the percentages would not have been materially affected.

There are two main reasons for paying special attention to these particular offences. First, they form a fairly homogeneous group, and in this respect they differ from certain other offences—e.g., dishonesty—in which the accompanying circumstances may be of the most varied character. Secondly, there is general agreement that offences of the kind described in this paper are specially deserving of investigation. It is not always easy to persuade those who have not made a deep study of the subject that a case of larceny, for example, may appear, superficially, to be quite simple, and yet may be due to most obscure mental causative factors. But in the case of these "sexual" offenders there is a general feeling that we are dealing with something abnormal. As a consequence, courts of law are often much more willing to remand the accused person for purposes of examination before finally dealing with him.

Great Variety of Mental Conditions.

It is to the great variety of the mental conditions which may be found that I desire to call special attention. And the general results obtained by examination are set out in the following table:—

	Indecent exposure.	Indecent assault.	Total.
Insane	4	4	8
Mentally defective	11	15	26
Subnormal intelligence	2	2	4
Undeveloped physically and mentally	—	1	1
Senile degeneration	4	7	11
Epileptic	2	—	2
Mental conflict	18	13	31
Negative results	9	8	17
	50	50	100

The cases described as insane were, of course, all certified as such, and removed to mental hospitals. There were four cases of dementia præcox, two of senile dementia, and two of confusional insanity.

The cases of mental defect were all estimated by my special scheme of tests,[1] supplemented, in most instances, by the Terman scale applied by another examiner. There were six imbeciles, three in either group. Of the 26 cases of mental defect, 18 were certified under the Mental Deficiency Act, 1913, and removed to institutions for defectives. In two cases, although the mental defect was undoubted, there was difficulty in proving its existence "from an early age," as is required by the definition in the Act. This difficulty is now generally recognised as being a bar to the full usefulness of the Act. One of these latter cases was that of a man aged 63 years, who had 29 previous convictions for offences of this kind, but of whom it was impossible to obtain any history earlier than the age of 30 years. The remaining cases classed as mental defectives were placed under supervision, except in one instance, where the offender was rather oddly dealt with by being placed on probation.

The cases described as of subnormal intelligence were those in which there was some degree of mental defect, but in which this did not appear to be sufficiently marked to justify certification under the Mental Deficiency Act. What degree of mental defect should justify such certification is a matter for argument. But I am not prepared to accept the conventional rule, adopted in some quarters, which holds that the non-attainment of some particular "mental age," as determined by the Terman or other similar scale, should be the decisive factor in the question of certification. The expression "subnormal intelligence" is, of course, not wholly satisfactory, for certifiable defectives are themselves subnormal. But the group of subnormals is generally recognised, and the term was originally used by Healy.[2]

Before dealing with the other varieties of mental abnormality which were found, it will be convenient to give an age-table for the whole series of cases.

	Indecent exposure.	Indecent assault.	Total.
Under 21 years	6	16	22
21–30 years	25	16	41
31–40 ,,	11	3	14
41–50 ,,	3	1	4
51–60 ,,	1	2	3
Over 60 years	4	12	16
	50	50	100

In considering this age-table, it must be kept in mind that, under ordinary circumstances, boys under the age of 16 years cannot be sent to prison. The only case below that age in my series was that of a mentally defective boy of 15 years, who was remanded to prison under Section 102 (3) of the Children Act, 1908. The number of cases in each age-group is too small to allow of any sweeping conclusions being drawn. But it would appear that there is a tendency for these offences to increase in number up to the age of 30 years, after which there is a fall, followed by a marked rise after the age of 60 years. And having regard to the comparatively small number of men living after 60 years, the figures are striking.

Senile Degeneration.

The cases placed under the head of "senile degeneration" form a sad group, with which it is not easy to deal. In these cases there was evidence that senile mental decay was occurring, but that this had not attained to a degree which justified certification under the Lunacy Acts. That the present legal criteria of "criminal responsibility" require reconsideration is now generally admitted. It is a question whether this particular class of case does not furnish as grave, or even graver reasons for such reconsideration as any other. The recent legal committee, presided over by Lord Justice Atkin, has recommended that the law should be altered, and that a person charged criminally with an offence should be regarded as "irresponsible for his act when the act is committed under an impulse which the prisoner was in substance deprived of any power to resist." Without entering into the extremely complicated questions raised by this proposed extension of the present rules of law, it may well be that many of these cases could be brought within the limits of the proposed new ruling. Several of these cases in my series were those of men of hitherto irreproachable life. Two of the cases were placed under the supervision of their friends, and one was sent to a nursing home. The others were sentenced to terms of imprisonment of varying length

because there seemed to be no other way of dealing with them. But it must, surely, be admitted that this is an irrational way to treat such cases, even bearing in mind the paramount necessity for the protection of society. Much has been made, in this connexion, of the influence of irritation caused by chronic enlargement of the prostate gland. There is no doubt that many of these cases present symptoms of prostatic enlargement. But we must, I think, be cautious in accepting this as the "cause" of the offence, for in most cases we find definite mental symptoms in addition to the prostatic enlargement. Nor is the improvement which has been claimed, in some cases, as occurring after surgical treatment entirely convincing. The mental effect of the operation must not be overlooked. Nor may we forget that the fact of the patient assenting to the operation is some evidence of "insight," on his part, into his condition, and of desire for a cure. Krafft-Ebing [3] has suggested that these sex offences, committed by elderly men, indicate weakened sexual potency. May not the explanation, at least in some cases, be that the offence is the result of a mental conflict between unconscious desire and conscious knowledge of diminished potency? In this connexion we must remember the marked tendency shown by elderly men to marry quite young girls. For a full discussion of the whole question see Bresler,[4] and for statistics see Aschaffenburg.[5]

The marital condition of the men was as follows: Disregarding the cases under 21 years of age, all except one of whom were unmarried, of the exposure cases 55 per cent. were single or widowed, 45 per cent. being married, while for the assault cases the percentages were 71 and 29 respectively.

Mental Conflict.

The cases assigned to mental conflict form the largest and the most controversial group. In 11 of these cases the court was found willing to accept this explanation of the offence, and to place the man on probation, with the condition in some instances that he should receive proper mental treatment. To what extent, and with what results this condition was actually complied with, I am unable to say. And this point is of great importance. For if, as I believe will be the case, these mental conflicts become generally recognised as the main causative factor in many instances of delinquency of all kinds, and not merely of sex offences, it follows that suitable provision, institutional or other, will have to be made for their proper treatment. It is suggested, not—as some appear to imagine—that these cases are to remain untreated, and the patients allowed to do whatever they please, but that the present method of treating them by punishment is altogether inadequate. I have included under this heading only those cases in which it appeared to me to be quite certain that a mental conflict was at the root of the trouble. These conflicts were of very varied character. Some were due to repression of early sex experiences or of sexual imagery. There were cases in married men in which the sex desire could not be gratified in the normal way because of objection on the part of, or separation from, the wife, accompanied by disinclination for extra-marital intercourse. And there were some cases among the younger unmarried men in which normal sex indulgence was prevented by ignorance, nervousness, or fear of consequences. I am not, of course, implying that unbridled or indiscriminate sex indulgence is to be advised in these, or in any other cases. The point is that in these cases there was failure to find satisfactory substitution.

The conflict cases were much more numerous among the younger men, 71 per cent. occurring in those under 30 years of age. This agrees with Healy's findings.[6] It is uncommon in my experience, as in his, to find evidence of mental conflict among older offenders, but the start of their delinquent careers may have been produced in this way. It may also be noted that the conflict cases were slightly more numerous among the exposure offenders. Investigation of a far larger number of cases is required on this point, but we might, perhaps, expect the findings of this present series to be confirmed. Indecent assault is a much more "understandable" offence, and that satisfaction may result therefrom is much more obvious. The offence may simply be a preliminary step to actual sex connexion. But the satisfaction derived from indecent exposure is far more difficult to comprehend. The patient himself often experiences this difficulty, and cannot explain why he committed the offence. This is the case with all offences due to mental conflict. There is often a peculiar absence of satisfaction resulting from the offence itself. The patient experiences a sense of impulse towards some action, a sense of tension, and the action results in relief of that tension. There is, to that extent, satisfaction, but there may be no more than that. It is an infantile type of reaction to endeavour to dispose of an idea by means of repression, and then to try to obtain some satisfaction for the instinctive desire which it connotes. It is an instance of the infantile character of the unconscious.

The high percentage of mental conflict cases in this series is confirmed by my studies of offenders of other kinds, as well as by the researches of other workers in this field. And it becomes clear that mental conflict is one of the most frequent causative factors in the production of delinquency. It is likely that further work will demonstrate that this is absolutely the most frequent factor. The implications involved in this finding open up a vast subject, which cannot be entered into here. But our entire conception of the cause of many offences, and of their rational treatment, will have to be radically altered. It may be true that some of these cases, for various reasons, are unsuitable for any form of treatment by mental analysis. On the other hand, many are most eminently suitable for this form of treatment.

The previous history of the cases was investigated as far as was possible. And the statements made, on this head, by the patients themselves were checked as far as possible. The absence of "field workers" was a great hindrance here, and this defect will have to be remedied in any future extension of this work. Friends and relations of the offenders were seen by me whenever such an arrangement could be made. Much useful information was obtained in this and in other ways. But this information does not lend itself to statistical presentation. The previous convictions of the offenders can, however, be given with a fair approach to accuracy. Of the exposure cases 14 (28 per cent.) had been previously convicted of similar offences, and 6 (12 per cent.) had been previously convicted of offences of other kinds. For the assault cases the figures were 11 (22 per cent.) and 9 (18 per cent.) respectively. That 25 per cent. of the whole series had been previously convicted of similar indecent offences is a very striking fact.

Necessity of Examination Before Conviction.

I am well aware that the whole number of cases is not large. I have had to choose between the intensive study of a small number of cases and the superficial examination of a larger number. In my view, the former of these two courses is the only one worth adopting. To assign some factor as a "cause" for delinquent actions, after a superficial inquiry, is a course which has been adopted far too often in the past. Many cases of other kinds have, of course, been examined during the period under review. The facts and figures of the present series are given rather as indications for the lines of future most necessary research than as a basis for any sweeping conclusions. But there is one inference which we may fairly draw. In only 17 per cent. of the cases in this series was the result of mental examination negative. And even among these negative cases there was evidence that one man had been previously certified as insane, in two cases chronic alcoholism was present, and one man was ultimately found to be suffering from a cerebral tumour. These facts surely

indicate the pre-eminent necessity for the fullest investigation of these and of other offenders. Such examination should precede conviction. This is the only logical procedure. And, further, the results obtained by examination before conviction are far more satisfactory than are those obtained by examination after conviction. The patient is at his best when he feels that he presents a problem which the examiner desires to solve. When conviction has taken place a new attitude of resentment is often set up, and this may persist for some time. I have dealt with this particular aspect of the matter more fully elsewhere.[7] Until mental examination has been made, a court is quite in the dark as regards the most important feature in the case. And it is much to be desired that certain kinds of offence, including all "sex" offences, should be investigated by an examiner possessed of knowledge and experience before they are finally adjudicated upon. We have now adopted the position that no person should be physically damaged by punishment, if such damage can be prevented. It would seem that this principle should apply to possible psychical damage. Yet there is no doubt that psychical damage is often caused to these subjects of mental conflict by imprisonment without proper mental treatment. The harm done by the indiscriminate serving out of sentences of imprisonment has been recognised by the Probation Act and by other legal enactments; there seems to be at the present day a marked tendency to make every effort to avoid sending any offender to prison. Indeed, it may be that harm is now done by placing some of these mental conflict cases on probation without any condition as to proper mental treatment. The whole question requires to be put on a sounder footing. And the intensive investigation of the individual offender is the key to the whole position. That the necessity of such investigation requires to be recognised by courts is shown by the fact that, of the 100 cases reviewed in this paper, no less than 15 were sentenced to imprisonment without any preliminary mental examination. These 15 cases included two of the insane men, all the six imbeciles, and four other mental defectives, and one case of subnormal intelligence.

This paper is published with the permission of the Prison Commissioners, but it must be understood that only my personal views are expressed therein.

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NOTES ON AN OUTBREAK OF EPIDEMIC ENCEPHALITIS WITH PAINFUL ABDOMINAL SPASM.

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THE constancy with which successive outbreaks of epidemic encephalitis have occurred at or about the same time in each year has been noted in all countries since its first appearance. It is just six years [1] since a small outbreak in this district ushered in the disease to this country, and true to its time, almost to a week, there is now a similar outbreak here rather more extensive in numbers. In this brief note I wish to call attention to certain features of this outbreak, which although containing nothing that has not been previously noted in other outbreaks in other parts, presents certain characteristics which have not been previously common here.

[1] THE LANCET, 1918, i., 568.

Nearly every outbreak differs to some extent from those preceding it in the same area, by the local predominance of some symptom or type. Thus, whilst among the present series there are classical cases of the oculo-lethargic and of the choreatic type, these do not form a large percentage of the whole. Most of the cases, on the other hand, show the following group of symptoms, one or more being particularly prominent in different cases.

1. Intractable initial insomnia, going on for many nights.
2. Delirium, in which throughout the whole night the business affairs of the day are repeated with merciless persistence (occupation-delirium). At times they become violent, but this is the exception, and does not, as a rule, persist.
3. Disorders of the respiratory mechanism. Attacks of dyspnœa with polypnœa, or irregular deep breathing. These occur mostly in the night and may continue during sleep. In some they have been present also during the day. They are quite unlike anything else, and in some cases have been the initial symptom.
4. Acute painful spasm of some muscle or group of muscles of the abdominal wall, the so-called abdominal myoclonus.
5. Ocular phenomena either in the form of loss of upward conjugate movement, with inability to raise the upper lids, or more general weakness of eye movement, and consequent disturbance of vision, the details of which it is difficult to ascertain. In some cases there is even a "visual apraxia." Nystagmus is common.

As stated above, marked lethargy has not been common. Fever is usually slight. A very foul tongue and obstinate constipation are usually present. It is, however, to the symptom of abdominal myoclonus that I desire to call particular attention. Unless its true nature is realised there is danger of it being mistaken for an abdominal emergency, which it may closely simulate. I have seen two cases, one in which it was thought to be an acute pleurisy, another renal colic. At onset it is the cause of very severe pain which recurs with every violent spasm of the muscles, and these may be firing off every second or at rather longer intervals. As time goes on they seem to cause less pain and indeed to go on without disturbing the patient at all. Why this is so I do not know, as the spasms seem as violent as before. Although any muscle may be involved, in all the cases I have seen the spasm has been either in the upper part of the rectus abdominis, either one or both sides, or in the left external oblique. The spasms recur at frequent intervals. They vary in depth, and in regularity. Tracings of them show some interesting features, but their investigation is not yet complete.

In the cases in which both the upper recti are involved the spasms may be, and often are, synchronous, but in one case they tend to alternate, first one side then the other contracting. That these cases, in which there is apparently nothing else than the painful abdominal myoclonus (the algo-myoclonus of Cruchet), are identical with other forms of the disease is shown by the series of cases here, for there has been every gradation from these to cases with slight other symptoms and finally to severe and even fatal cases showing lethargy ocular and other cranial nerve palsies, &c. As a matter of fact, almost every case in which this myoclonus is present will show on careful inquiry or full examination quite definite stigmata of the disease. You will find that there has been occupational delirium for a night or two, or something queer about the breathing, or a temporary complaint as to vision, or that there actually is some unsuspected disorder of eye movement in some direction, or unequal pupils or possibly a nystagmus.

A considerable number of cases of so-called epidemic hiccough has also occurred here recently, and one of the abdominal myoclonus cases was said to have had this at the onset, but I am not quite certain of this. Most of the hiccoughs clear up in three or four days, whereas the clonus may continue for several weeks.

THE SPEECH CLINIC.

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THE death of Prof. Hermann Gutzmann, of Berlin, affords an occasion to consider the department of medicine which he did so much to create. That the abnormalities of speech were of very great importance, not only for purposes of diagnosis but also as instruments for pathological research, had long been recognised by such men as Brücke, Kussmaul, and others, but down to about 20 years ago no one had devoted himself to speech pathology as his life work. Prof. Gutzmann was one of the first to do this. In Berlin he developed a well-equipped speech clinic and laboratory for studying speech abnormalities. For many years he edited the *Monatschrift für die gesammte Sprachheilkunde* which was later merged in *Vox*. He instructed large numbers of medical students to understand speech and to treat the various forms of speech defect. One of his pupils has established a similar laboratory in Vienna. Many medical men have studied the subject with a view to adding it to their regular work.

Outside Germany little has been done. Shortly before Gutzmann took up work at Berlin, I started a speech clinic at the Vanderbilt Clinic in New York city. For the last seven or eight years I have conducted a speech clinic at the West End Hospital for Nervous Diseases in London. Otherwise, as far as I can learn, nothing of the kind has been done in England.

Lack of Knowledge of Speech Phenomena in England.

The most striking fact of the situation in England is the complete ignorance of speech phenomena, not only among practitioners but also among neurologists and laryngologists. For more than fifteen years I have been in constant association with neurologists and have never met one who could diagnose the dysarthrias correctly. Any muddled kind of speech is said to be a dysarthria. The most frequent dysarthria of all, that of the larynx, is never recognised. The most prominent feature of all dysarthrias—the effort to overcome the defective action of the speech mechanism—has remained absolutely unknown. I have often pointed out that the most prominent feature of speech in a case of disseminated sclerosis is not the ataxia, but an effort to overcome the ataxia—that is, what may be called "anataxia." I can remember the surprise and pleasure of a distinguished neurologist when I compared an inscription of a case of Landouzy-Dejerine with normal ones, and showed how the former was pathological just because it was too perfect. In a case of Friedreich's ataxia this over-perfection in enunciation was likewise found; the disease made itself evident only in the longer time required. Of the speech signs in more central troubles the ignorance is complete. Every medical student knows that to stumble over "third riding artillery brigade" is a sign of general paralysis, but not even the best neurologist has the faintest notion of what the patient really does when he stumbles or why he does it. In the earlier cases the neurologist regularly misses the speech defect because he does not know what to look for. Other forms of speech defect remain quite unknown. The epileptic voice is just as characteristic and clear a sign as any dysarthria, and the ear can be trained to detect it. Year after year I have sat in nerve clinics and diagnosed the cases as epilepsy or not epilepsy by the manner in which the patient begins to speak. Although a trained ear never makes a mistake, the neurologists are quite ignorant of the existence of this sign.

The laryngologist contents himself with what he can see. He considers that when he has treated any organic trouble or has recommended an elocutionist his duty is over. He does not bother himself about the inner nature of the defect or its cure. Owing to their lack of information medical men in general never make any attempt to give an accurate speech diagnosis. When confronted with one of the special speech defects, all they can do is to state that the case is hopeless, or will cure itself, or had better be taken to an elocutionist.

Function and Equipment of the Clinic.

The solution of the difficulty lies in the establishment of speech clinics for diagnosis, research, and instruction. Such a clinic can justify its existence in the first place by what it can do in the way of diagnosis. It can—by the method of making speech inscriptions, and studying them under the microscope—furnish accurate diagnoses of general paralysis and disseminated sclerosis at a stage so early that no speech defect can be heard. Let it be remembered that general paralysis has been cured if treated by malaria at an early date. Let the possibility be remembered of mistakes between early disseminated sclerosis and hysteria, so that we may be careful not to send a case of the former to a psycho-analyst. Let it also be remembered that early cases of disseminated sclerosis can be cured by the Wagner-Jauregg method. The inscriptions of adiadokokinesis and other manifestations of dysmetria are so easy to make, and so striking, that they are useful in telling when the cerebellum is diseased or involved in a tumour.

Equally important is the service of a speech clinic for the purposes of research. Inscriptions of epileptics always show a peculiarity that has never been found in any other disease. They furnish a proof of the view that idiopathic epilepsy is not a disease of the cortex, but a special condition of the patient's character.

A third claim for the speech clinic is its usefulness for treatment. Over 600 cases of laryngectomy have been taught to use ructus speech at the Phonetic Laboratory in Vienna; many of them have been restored completely to work even when telephoning is involved—that is, they were taught to speak audibly by air from the stomach, although they had no larynx and breathed through a cannula. In the clinics at Berlin and Vienna the treatment for the various forms of aphonia has reached a high degree of efficiency. I have found that, in combination with other methods, the training of epileptics to eliminate their peculiar voice is followed by improvement in the general condition. The treatment of stuttering on the basis of clinical researches would put an end to the present methods of the elocutionists.

A further claim is that of usefulness for instruction. Speech is the most complicated and delicate manner in which mind and nerves express themselves. It contains more kinds of diagnostic information than many another manifestation, and its pathology, if properly learned, is as useful to the practitioner as a urinary analysis.

One obstacle to the establishment of speech clinics has been the difficulty in obtaining the apparatus required. To various inquirers in the past I have been obliged to reply that the only recording drums of sufficient accuracy were an expensive one made in Leipzig and a cheaper one that could be made to order in America. The speech recorders could be obtained only in Paris. The highly important laryngostroboscope could not be obtained anywhere. This obstacle has now been completely overcome by what might be called the fortune of war. Under the new government the Ministry of War of Austria teaches every soldier a trade. One department of the instruction is that of making fine apparatus. All the apparatus for speech work is now duplicated with a fineness and precision equal to and often better than that obtainable by the best German and French mechanicians. The crux of the matter lies in the fact that it is forbidden to charge for the labour or to make a profit. The only charge is for the cost of the raw metal used. A complete speech laboratory can be equipped for a sum so modest that even the poorest hospital need not think twice about it.

Clinical and Laboratory Notes.

UNCOMMON CONDITIONS ASSOCIATED WITH LIVER LESIONS.

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THE following cases seem worth recording from both the clinical and the pathological standpoint, as the clinical course in each case was unusual, and the post-mortem findings, especially in the liver, uncommon.

CASE 1.—A girl, aged 8, admitted to the Bagthorpe Infirmary on Nov. 9th, 1923, suffering from extreme hoarseness and sore-throat. Temperature 99° F. She was put on salicylates, and the temperature dropped. On the 16th the temperature went up to 102°. Examination only revealed a faint apical systolic bruit, and a rather sharp pulmonic sound. Next day the child was intensely ill—ashen, drawn face, sordes on lips, and tongue like leather—not at all unlike the extreme toxic appearance of a patient dying of peritonitis. The temperature ran an intermittent course, reaching 103° on a few occasions. Examination revealed nothing further until the 20th, when signs of consolidation appeared in the left lung. The child died on the 25th.

Post-Mortem Examination.—Extensive pleural adhesions at left base, which was pneumonic. Aortic and mitral valves intensely inflamed. Neither valve was ulcerated, but when opened out the cusps formed a bright crimson line across the ventricle. Tricuspid valve also inflamed in parts, but not so extensively. Abdomen distended and full of fluid of ordinary ascitic type. Liver was greatly enlarged and typically "hobnailed." Spleen enlarged, and pancreas felt abnormally hard. Sections of liver showed characteristic unilobular cirrhosis, and sections of pancreas showed extensive fibrosis.

CASE 2.—Male, aged 22, admitted on Nov. 23rd, 1923, with a diagnosis of influenza, having been ill a fortnight. He gave a history of having had several attacks of "boils," but on admission showed no evidence of a current attack. His temperature on admission was 100·4° F., and except for severe pyorrhœa examination revealed only some impairment of resonance and breath sounds on right side of thorax posteriorly. Patient was unusually drowsy, and as his chart suggested in the course of a few days a septicæmia, a blood culture was performed. This gave a pure growth of *Staphylococcus aureus*. On the 28th exploration of the right base gave a slightly hazy fluid mixed with much blood. On this day, also, a septic rash appeared on the arms, and the patient was incontinent at times. On Dec. 3rd exploration at a lower level than previously discovered abundant pus. Resection of a rib had an unexpected sequel—the pleural cavity contained no pus, and an abscess of the lung was regarded as the site of the pus. Next morning the patient had a right parotitis and died that day.

Post-Mortem Examination.—Bases of both lungs pneumonic, with marked purulent pleurisy. Heart and aorta small, but no valvular lesion in heart. A large abscess *in* the right lobe of the liver in its upper aspect almost on the point of rupture. The abscess appeared localised and apart from it the liver did not present a pyæmic appearance. The spleen was enlarged and the kidneys congested.

Remarks.

Case 1 is chiefly of pathological interest in view of the intense widespread inflammation of the valves of the heart and the extreme cirrhosis of the liver in a child of 8. How far this cirrhosis contributed to the extremely toxic state of the child invites speculation.

In Case 2 arises the question of the origin of the septicæmia. The patient had never been abroad, and had no history of dysentery. The extreme pyorrhœa, or the lighting-up of a dormant focus left after one of the attacks of "boils," both seem possibilities. (A similar fatal septicæmia occurred recently in a boy aged 18 without any obvious focus, but six months previously the boy had a severe septic finger which apparently healed completely.) As regards locating the pus, if the abscess had been in the lung, the latter would probably have been adherent to the parietal pleura, while the empty thorax, the height of the diaphragm, and its tenseness, should have suggested a subdiaphragmatic source.

A CASE OF INTRAPERITONEAL OVARIAN PREGNANCY WITH A FULL-TERM CHILD.

BY S. SUVANSA, M.R.C.S. ENG.

(From the King Chulalongkorn Memorial Hospital, Bangkok, Siam.)

THIS case is recorded as intraperitoneal pregnancy with a full-term and living child is unusual.

A married woman, aged 37, was admitted into the maternity ward of the hospital, under the care of Phya Damrong-baedyakun, on August 9th, 1923, complaining of abdominal pain and bleeding from the vagina.

History of Present Condition.—In December, 1922, patient missed her period, but in January the flow appeared again and at the expected time, lasting seven days. It was, however, offensive. Since then there had been complete amenorrhœa. At about this time she suffered somewhat from morning vomiting and frequency of micturition. No change in the breasts was noticed by patient until a few months ago, when they seemed to be distended and a little yellowish secretion could be squeezed out. The child was first felt to move about the fifth or sixth month. Two days before admission patient bled from the vagina. A doctor was called in, who diagnosed the case as antepartum hæmorrhage, and sent her to hospital.

Past History.—Patient had been in good health. Her periods had been regular, being present at intervals of 28–30 days, lasting four to seven days. There had never been any leucorrhœa. Patient had suffered from indigestion for the last four to five months.

Family History.—She had had five pregnancies, of which there were three children and two miscarriages (the second and fifth, each of about seven to eight months). The latter miscarriage happened in 1916. In 1919 patient, who had lived with her husband since marriage, obtained a divorce and married another man. The present pregnancy was the first after the second marriage. Her second husband is 24 years of age.

Condition on Admission.—Patient, who appeared quite calm, was a thin and somewhat pale-looking woman. The temperature was 98° F. and the pulse-rate 110. The pupils reacted well to light and accommodation. The conjunctivæ were slightly pale. The breath was foul, though the teeth were fairly good. There were no enlarged glands felt in the neck. Nothing abnormal was found in the lungs or heart. An oval lump was seen in the abdomen, which reached from the symphysis pubis to about 2 inches above the level of the umbilicus. Its long axis was from the left below to the right above and about 45° to the vertical. Knobs were seen on the lump. The abdominal wall was thin, and the lump was recognised as a fœtus lying in the left occipito-anterior position. A limb could be picked up between the fingers when the fœtus made a convulsive movement. The fœtal heart-sound was heard near the umbilicus. The vaginal orifice was covered with varicose veins. The speculum was carefully inserted, but one of these bled. It was immediately ligatured. The cervix was found enlarged, œdematous, rather soft, and mauve-blue in colour. When it was moved there was no transmission to the lump in the abdomen. On withdrawing the examining finger a somewhat profuse bleeding from within the cervix occurred, the blood being bright red.

Diagnosis.—As the abdominal wall was thin and the fœtal parts could be so easily palpated, and no uterine contraction was obtained, a diagnosis of extra-uterine pregnancy was made. The bleeding from within the cervix, however, could not be explained; but in a former case of extra-uterine pregnancy which was admitted into hospital not more than ten days previously—a remarkable coincidence—and had a fatal termination, there was also bleeding from within the cervix.

Treatment.—As the bleeding stopped of itself, and as the patient appeared very weak, operation was postponed and a careful watch was kept over her. On the 17th the child was kicking continually, causing a faint feeling with severe abdominal pain; and blood was observed to flow from the cervix more profusely than before. The uterus and the vagina were thereupon packed with strips of gauze, and an immediate operation was decided upon.

Operation.—The patient was placed in the dorsal position. The skin was cleaned with absolute alcohol and swabbed with iodine. An incision was made in the median line extending from the umbilicus to the symphysis pubis. Skin and the fasciæ were divided until the peritoneum was seen. This was picked up and carefully divided, when the breech of the fœtus became exposed. The right hand was introduced into the abdominal cavity, and the child was seized by the legs and delivered. It was quite blue. The

mouth was swabbed with gauze and the umbilical cord ligatured and divided.

On examination the placenta was felt adherent to the under surface of the liver and the right side of the abdominal wall. It had a downward process which seemed to envelop the right ovary and the cæcum. The uterus was about the size of a three months pregnancy, and was somewhat flabby. The uterine tubes and the left ovary looked normal. The infundibulum of the right tube was implicated in the placental process. The placenta was left in situ for fear of uncontrollable bleeding if removed. The abdominal wall was closed in separate layers. The patient was under chloroform in five minutes, and the child was delivered five minutes later. The whole operation took 25 minutes. When the abdominal cavity was opened, a little clear fluid was observed. No membranes were found, but when the child was delivered a portion of the membranes was seen capping its head tightly.

The Child.—The child remained blue and refused to cry, breathing weakly for fully five minutes, during which it was placed in a warm bath and slapped, and artificial respiration was applied. Though it could breathe better, it was still somewhat blue for three days after. No congenital heart disease was detected. The child was a full-term and weighed 2260 g., or 5 lb. (The average weight for a Siamese new-born is 3000 g., or 6½ lb.)

Later Notes.—At the end of 24 hours the vaginal plugging was removed; the bleeding had stopped. Much anxiety for the child was felt on account of the cyanosis. Small quantities of warm water were given during the first day. On the second day it was put to the breasts of a woman who had just given birth to a child in the same ward, and who had enough milk for two. The mother had been feeling very weak since the operation. Her breasts contained little milk, which was withdrawn with a breast-pump, as it caused an uneasy feeling in the organs. Some anxiety was still felt as to what might happen to the placenta. On the 24th the wound had healed. The temperature and pulse had been about normal. Patient felt somewhat weak and appeared listless. On the 31st, till which day the patient had been feeling weaker and weaker, the temperature went up to 103° and the pulse-rate to 90. On Sept. 9th the temperature, which had come down somewhat, went up again to 104°. The patient became very weak, and died at 1.30 A.M.

The child (a girl) has been and is progressing satisfactorily. Its weight has been increasing as follows:—Fed on human milk: August 24th, 2260 g.; Sept. 1st, 2440 g.; 7th, 2540 g. Fed on bovine milk: Oct. 1st, 3250 g.; 8th, 3410 g.; 15th, 3470 g.; 22nd, 3750 g.

Post-mortem Examination.—The heart, liver, spleen, and kidneys were soft and pale-looking. In fact there was general anæmia. To the under surface of the abdominal wound were adherent the great omentum and anterior portion of the placenta. The placenta itself was roundish in shape, lobulated, and contained in a capsule, looking very much like a multilocular ovarian cyst. It was attached to the end of the right uterine tube by a stout stalk, and the right ovary could not be found. The left tube and ovary were natural in appearance. The uterus was about the size of the fist. The placenta was anchored by adhesions to the omentum and bowels which were easily stripped off from the capsule, when the mass became free save at its lower attachment to the tube. The placenta did not look infected, but the general peritoneum was dull-looking, congested in a few places, and appeared thickened. Section of the placenta showed presence of lymphocytes in the region beneath the capsule.

Death was presumed due to lowering of body resistance following chronic peritonitis and general anæmia.

THE LATE DR. W. B. BETENSON.—The death occurred at Newhaven on March 8th, after a long illness, of Dr. William Betenson Betenson. A native of Suffolk, he studied medicine at St. Bartholomew's Hospital, and in 1888 took the L.S.A. diploma and became L.R.C.P. Lond. and M.R.C.S. Eng. For some time he was house surgeon at All Hallows County Hospital, Ditchingham, and in 1901 started practice at Newhaven. He became attached to the local R.N.V.R. in 1904, and during the late war he had a distinguished record. He went to the Dardanelles as surgeon-commander on H.M.S. *Bacchante* (1914–16) and later served on H.M.S. *Powerful* at Devonport. Afterwards he served with the R.N.V.R. at Newhaven. Dr. Betenson was popular in the service and also as a private practitioner, and despite an extensive practice he found time to identify himself actively with public affairs. Before the war he was a member of the Newhaven Urban Council and for a year held the position of chairman with a seat on the magisterial bench. For many years he was medical superintendent at the Union Infirmary, Newhaven.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ELECTRO-THERAPEUTICS.

CLINICAL RESULTS OF DEEP X RAY THERAPY.

A MEETING of this section was held on March 21st, when a discussion was held on the Clinical Results of Deep X Ray Therapy. Dr. WALTER J. TURRELL, the President of the section, was in the chair.

Dr. WILLIAM MITCHELL (Bradford), in opening the debate, explained that his remarks would be based on 20 years of experience at Bradford in radiotherapy, and that his technique was that recently described by Vince in his book. As a result of much unwise comment in the press, a much greater demand for X ray treatment had been made than was justifiable, many false hopes were raised, and those who had been feeling their way on the subject had found their hands forced, for it came to be regarded as almost a crime to refuse to treat a case in this way, however hopeless it might be judged. Of 133 malignant growths treated 30 were carcinoma of the breast, 28 epithelioma of jaws, tongue, and larynx, 1 of forehead, 8 cancer of the pelvic colon and rectum, 7 of cervical glands, 2 of superior maxilla, 4 sarcomata, 2 carcinoma of the body of the uterus, 20 of the cervix uteri, 2 of the pancreas, 2 sarcoma of skull, 1 chondro-sarcoma of pelvis, 1 epithelioma of ear, 2 carcinoma of kidney. Stomach, bladder, and rectal cases, 1 osteo-sarcoma of clavicle, and 1 myeloid sarcoma of the head of the femur, sarcoma of buttock and lympho-sarcoma of neck. Hodgkin's disease, uterine fibroids, carcinoma of thyroid, splenic leukæmia, and some minor conditions were also treated. Forty-eight of the 133 cases were hopeless before treatment was commenced, and 46 of the cases were post-operative recurrences. At the end of a year 41 had ceased attending before completing their course, many because their doctor advised them that the treatment was probably doing them more harm than good, some because they felt the treatment was upsetting them. Of two cases of cancer of the cervix uteri, both of which he at one time thought were cured, one had a severe recurrence and refused to have further treatment. In two cases of carcinoma of the pelvic colon who had had colotomy performed, the result of the treatment seemed good, and one was still living, though with a fæcal fistula. One case of carcinoma of the bladder, in which that viscus had been opened and cauterised, he had treated six times with a 20 per cent. dose, at the end of which course the man was in good condition, nothing could be felt per rectum, and urine was passed easily. After each treatment the urine remained clear for three months, but then blood reappeared in it. The four breast cases appeared to do very well. A case of lympho-sarcoma of the neck at one time seemed cured, but there was a recurrence, and death took place from pulmonary metastasis. A myeloid sarcoma of the humerus, in a girl aged 6, was cured by the treatment; he exhibited skiagrams showing the regeneration of bone which had taken place. Tuberculous dactylitis did well, as indeed it did in former days, with the old treatment. It was, he thought, impossible to promise cure of malignant disease by X ray therapy, chiefly because metastasis was an unknown quantity before treatment was commenced. If a case were treated while in a hectic condition, it was probably made worse than before. The most favourable cases were those with a good blood count and high hæmoglobin index. There was a difficulty in regard to beds in hospitals for the treatment of these cases, hence in too many cases these patients, after each séance, had to return to their squalid and insanitary homes, a fact which seriously militated against good results. Practically all cases, excepting the hectic ones, received temporary benefit from the treatment, and expressed themselves as much fitter in general health.

The Dual Effect on Patient and Growth.

Mr. SAMPSON HANDLEY said the time had passed when surgery alone could claim to deal with malignant disease; in nearly all cases the help of the radiologist was necessary. Yet he was not clear that what was known as deep X ray therapy was the sort of help the surgeon would ask. The effects of deep X rays on patients with malignant disease should be placed under two headings: (1) the effects on the patient; (2) the effect on the growth. The former still stood in need of investigations by the biochemist, and those made at Middlesex Hospital by Dr. E. C. Dodds and Dr. J. H. D. Webster[1] deserved careful consideration. The former had thoroughly investigated a few cases, rather than more cursorily examining a large number, an intensive method of study which the speaker commended. These observers had found that while irradiation of the head, neck, and thorax had little effect on the urine, irradiation of the abdomen profoundly modified the urine, producing an immediate large drop in its amount and a variation in its essential constituents. They attributed this to a temporary inhibition of the functions of the principal abdominal glands, such as liver, pancreas, and kidneys. When the abdomen was irradiated there was a marked fall in the blood-urea content. Patients subjected to heavy X ray doses, especially applied abdominally, suffered from profound asthenia and loss of vitality—i.e., to a degree greater than could be accounted for by the disease for which they were treated; in this X rays afforded a striking contrast to the results of treatment by radium, which appeared to have a stimulating action, giving the patient a sense of increased well-being. Even sufferers from inoperable malignant disease had told him, when being treated by radium, that they had never felt so well in their lives. The effects of deep X ray therapy in amounts necessary for the surface treatment of deep-seated tumours were so marked that in such amounts the use of the rays was undesirable and deleterious. As to the effects of irradiation on the tumour itself, in certain cases there was undoubted benefit, while in others, actual stimulation of the growth took place. Mr. Handley proceeded to describe some cases. In the case of three patients who were subjected to deep X ray therapy, within a short time of the commencement of the treatment, new superficial metastases developed within the area treated. One was a breast carcinoma with recurrent nodules. Deep therapy had been carried out for the nodules, but fresh ones appeared there. Another was a carcinoma of the neck, with a recurrent mass just below the jaw secondary to carcinoma of the larynx, and shortly after deep therapy had been applied to the neck, the scar was a mass of secondary nodules along its length. In the third case the speaker excised part of the stomach for gastric carcinoma. Deep therapy was applied prophylactically, because he felt his operation must have been an incomplete one. Within two months of the treatment having been commenced, masses could be felt deep down in the abdomen. In one case of retro-peritoneal carcinoma, the primary growth probably being in the pancreas, for a mass could be felt there, enlarged glands existed in the right iliac fossa. That was in September, 1922. He thought the patient's life would be about three months. Dr. Douglas Webster applied deep therapy, after which the glands in the right iliac fossa disappeared, the patient seemed much better, and began to get about again. But the mass above began to grow again, and death took place two months ago. In that case he believed the deep therapy prolonged life about a year. For a man with carcinoma of the prostate, Mr. Handley buried radium into the lateral aspect of the prostate through punctures in the perineum. Improvement followed this, but he still had a mass in the right vesico-sacral fold, palpable per rectum, and he developed some glands in the right iliac fossa. After this one radium application, Dr. Webster treated the patient by deep X ray therapy, having begun it in February, 1922. If the case had been left the patient would probably have been dead by now, but he was still going on, all the glands in the left iliac fossa had disappeared, and the former œdema of the left leg had now gone. An opinion on the efficacy of the treatment was only possible after a long period of observation of cases. The technique was still fluid. His general view was that a medium must be observed between an X ray dosage which was inadequate to act on the growth and that which was harmful to the patient, and he did not think that balance had yet been effectively struck. The use of buried radium, in suitable cases where the area to be dealt with was small, possessed great advantages over deep X ray therapy, in that, with the radium, application of a maximum amount of irradiation of the growth could co-exist with a minimal irradiation of the tissues generally. In deep X ray therapy, however, irradiation of the tissues generally was hard to avoid, and was usually deleterious in its effects.

[1] THE LANCET, March 15th, 1924, p. 533.

Favourable and Unfavourable Conditions.

Dr. G. COOPER (Leeds) spoke from an experience of 400 cases of all varieties of malignancy. In most of the cases in which X ray therapy was applied there was a marked improvement in general health and an increase in weight shortly after the commencement of the treatment; it seemed as if the growth had been temporarily checked in the intensity of its malignancy. Pari passu with this there seemed to be a staying of toxic action. A decline in general health seemed to be associated with a return of activity of the growth. There was in many cases a cessation of discharge and relief of pain following the treatment, and, particularly when hard rays were used, a formation of fibrous tissue, the latter being probably an important factor in limiting the spread of the disease. Healing of rodent ulcer coincided with the formation of a dense layer of scar tissue, which cut off the normal from the malignant cells. Among the factors influencing the degree of response to the treatment were the amount of metastasis, the situation of the growth, the condition of the patient, especially the blood condition, the nature of the neoplasm, and the amount of irradiation administered. His best results had been obtained in genito-urinary conditions and pelvic conditions generally, but cancer of the cervix had shown a tendency to relapse, after the first improvement which practically always took place. By means of this therapy many cases adjudged inoperable had been rendered operable. There were also encouraging results in cancer of the rectum; pain was controlled, and the size of the growth reduced. Except in one case (in which the radiation was given at the time of operation) he had found the treatment in cancer of the stomach very unsatisfactory; nor had there been a favourable response in cancer of the tongue. A much more favourable report could be made concerning the treatment of primary glandular enlargements. In cancer of the parotid and thyroid glands, he had had good results at first, but nearly every such case subsequently developed metastases. The urgent dyspnœa of malignant disease of the mediastinum was often relieved by the treatment, but relapse occurred in three or four months. In spleno-medullary leucocythæmia an enormous reduction in the size of the spleen was effected in two or three weeks. Since the introduction of deep therapy more advanced and definitely hopeless cases were brought for treatment; it offered the only treatment likely to bring relief, and it could be said that more had been done for malignant disease by it than had hitherto been achieved outside the domain of surgery.

The Response of the Body Tissues and Fluids to Radiation.

Dr. ROBERT KNOX reminded the meeting that deep X ray therapy was not by any means a new departure, and it did not originate at Erlangen; in this country it had been steadily developed along sound lines. It was assumed that a particular lesion of the skin stood

a certain dosage, and that if there were a deeper-seated lesion it would respond to a similar dose. Deep therapy was based upon that: it was a logical extension of surface therapy, and was a question of wave-length. The points he wished to make were largely based upon Mr. Sampson Handley's work on the natural process of cure in cancer embodied in his book on cancer of the breast. It was necessary to supplement nature's efforts at cure: instead of depressing the tissues, efforts should be made to enable them to overcome the disease. In many cases that was what the radiologist did. In treating blood conditions in this way it was found that the blood cells responded in various ways to irradiation, and one of the lines of inquiry should be concerning the alterations in blood, blood serum, and the various biochemical processes. The work of Dodds and Webster was very fine in this respect, and if pursued would take the profession a long way in a rational therapy, and probably standardise the technique. The response of enlarged lymphatic glands to irradiation he had found to be remarkably rapid; not so rapid in lymphadenoma, less rapid still in lympho-sarcoma (and a greater tendency to recurrence). In sarcoma the reaction was not so certain, and in carcinoma there was an uncertain reaction. Dr. Knox then referred in detail to a number of cases and projected slides of them on to the screen. One of the most remarkable was that of a man who six years ago had a testicle removed for a carcinomatous condition. He had fairly frequent doses of X rays for two years. He then came with a large mass in his abdomen, which was regarded as malignant. A fairly heavy dosage was applied, and it disappeared in a remarkable manner. Early last year he came with a mass of glands in the supra-clavicular region, and had pleural effusion at the left base and a very large mediastinal tumour. Penetrating rays in considerable dosage were administered, and the left pleural effusion cleared up. The tumour was much reduced in size, but there was later effusion at the right base. In the course of time the right-sided effusion cleared up, and at present he was carrying on his duties (those of a clergyman). Dr. Knox expressed himself as a supporter of the idea that rays of lesser potency than those directed at the original growth had a stimulant action on secondaries which such rays reached, and he quoted a case supporting that view.

The Case for the Full Single Dose.

Dr. REGINALD MORTON gave some general impressions which he had formed as a result of his clinical experience. The great advantage of this modern development of X ray treatment was that it enabled one to treat centrally situated lesions with greater efficiency than superficial ones. As to the relative advantages of single and of multiple sittings, there was much to be said on both sides. The idea of the single full dose was to avoid stimulating a growth to increased activity; now and again there were cases whose increased activity could not be accounted for on any other supposition. These, however, were but a very small percentage of the whole. There was a smaller margin of error in dosage in the administration of a single dose. Even in deplorable cases giving but little hope, if X ray treatment were clamoured for it should be given. He did not think the percentage of successes from X ray treatment by modern methods was greater then formerly. In this country it was still the custom to send to the radiologist only the practically incurable cases. Hard tubes and heavy filtrations formed a homogenous means of using the rays, but they did not appear to have any more specific action on living cells. A series of cases of rodent ulcer which he had treated by the Erlangen method gave no better results than a similar series dealt with by the older technique. Some of his best results had been in pelvic conditions. Cases involving the air-passages and the neck generally were unfavourable; cartilage did not respond well to the rays. Some cases of cancer of the rectum responded very well, and prostatic involvement yielded successful results in a high percentage, especially simple enlargement of that gland as distinct from malignant conditions. In none of his cases had irradiation brought about any serious fall in essential blood cells, and he thought too much stress was usually laid on this danger. In this connexion, length of exposure was an important factor.

Dr. CURTIS WEBB spoke of the favourable results he had secured by the Erlangen method during 18 months, and related a number of cases. He favoured at present the single massive dose, in contrast to the divided dosage as mostly practised in France, chiefly because by the latter one could not be certain that the full intensity of irradiation reached the deeply situated disease.

The Combination of X Rays and Radium.

Dr. N. S. FINZI spoke of the good results achieved by deep X ray therapy a number of years ago, and instanced a case of his own, that of a boy with retro-peritoneal lympho-sarcoma, whom he treated in 1911 with hard rays filtered through 2 mm. aluminium. He was cured and was seen in good health last year. He was decidedly of the opinion that modern methods were superior to the old, and that they gave better results. The feeling was too prevalent that either X rays or radium must be used; often the best results were secured by a combination of the two. The primary growth was often best treated by radium, while the region permeated by the malignant cells could be irradiated most effectually by X rays. Also splitting the radium into two foci was valuable. Radium therapy was advancing in parallel with X rays. He agreed that the changes produced in the blood by radio-therapy had been exaggerated. Septic cases did not do so well as others, by either method. When breast cases were complicated by mediastinal involvement he regarded the outlook as bad. Giving the patient chloratone before the irradiation helped to ward off sickness.

Dr. LOUISA MARTINDALE related her experiences based upon 160 cases. She had seen very little sickness, a fact she ascribed largely to her preparation of the patient—i.e., as for an abdominal operation. Of 50 female castration cases, sickness occurred in only 2. Severe menorrhagia yielded well to X rays.

Dr. J. H. D. WEBSTER advocated a close study by radiologists of pathological processes. The best prospect from X ray and radium treatment was produced by causing a powerful caustic effect on the malignant cells, and this was effectively brought about by multiple small radium tubes. In some classes of cases the right course was to try and restrain the growth by building up the patient's health and powers of resistance. He agreed that small doses of the rays resulted in a stimulation of the new growth. There was always the danger that the area harbouring the minute seeds of the disease was not coming under the influence of the treatment. More investigation should follow the important discovery that irradiation caused the disappearance of certain types of rare blood cells.

The PRESIDENT thought a third treatment which wat worthy of consideration was diathermy. He did nos support the treatment by deep X rays of fibroids at the menopause, reminding members of the importance of the endocrine functions of the sexual organs, which were not yet fully understood. Small repeated doses seemed the best course, as being calculated to injure as little as possible the endocrine activities.

IRISH MEDICAL SCHOOLS AND GRADUATES ASSOCIATION.—The annual meeting and St. Patrick's Day Dinner of the Association was held at the Hotel Cecil, London, on March 17th. Dr. W. J. Corbett, the President, was in the chair, and the speakers included Lord Shaw and Senator Marconi. About 120 members and guests were present, among whom were Sir William Taylor, Dr. William Douglas, and Dr. Michael Bulger, past presidents of the Association.

MEDICO-LEGAL SOCIETY.

SUDDEN DEATH BY INHIBITION.

A MEETING of this Society was held at 11, Chandos-street on March 18th. In the absence of the President, Mr. W. WILLIAMS was in the chair.

Dr. PERCY B. SPURGIN introduced a discussion on Cases of Sudden Death by Inhibition, and their Medico-Legal Bearings, by telling the story of a tragedy which occurred on Oct. 11th, 1923. On that day, a day of intermingled sunshine and showers, James Murphy, a healthy and powerfully built young man of 21, took his dog out for exercise in Regent's Park. A shower drove him to take shelter beneath some trees under which Alfred Muchmore and a friend were kicking a football. Murphy's dog annoyed Muchmore and his friend by chasing the football and caused the friend to shout gruffly to Murphy to call off his dog. A few angry words ensued and then Murphy came over to the two friends and knocked down Muchmore, a much smaller man than himself, by a blow on the jaw which cut his lower lip. Muchmore and Murphy then fought until some spectators warned them of the approach of the park keepers, upon which they separated, but only to meet once more a few minutes later in another and more deserted part of the park and resume the fight. On this occasion Muchmore "knocked out" Murphy and left him lying on the ground, as he imagined and remarked to his friend, in a condition of being "winded." When he read later in the evening papers that Murphy had been found dead in Regent's Park he immediately reported at a police station and gave himself up. Dr. Spurgin was called upon by the coroner to perform a post-mortem examination three days later. Externally there were bruises on the forehead, on the left supraclavicular region, and on the thorax. Internally no abnormality was discovered other than in the heart. Both ventricles and the left auricle were so firmly contracted as to be quite empty of blood and the heart muscle itself was pale. He was driven to conclude that death was due to cardiac inhibition from stimulation of the vagus by a blow on the left side of the neck. The coroner accepted this view. Dr. Spurgin added that at the subsequent trial of Muchmore at the Old Bailey on a charge of manslaughter he was found guilty and sentenced to four days' imprisonment, which was equivalent to his immediate release.

Two other cases of death from a similar cause could be added. One, reported in the *Practitioner* of January, 1924, was that of a man of 52 who died of syncope while his wife was buttoning on his collar and thus causing pressure on the neck. In this case similar conditions were found in the heart at the post-mortem examination. Another case of death probably from the same cause was that of the English boxer Evans, who died during a contest in Holland.

Sir BERNARD SPILSBURY recounted some cases in which the cause of death was slightly different from that given by Dr. Spurgin. The first case was that of a female child, 3 years of age, who while taking a meal gave a slight cough and then fell back in her chair and gave no further sign of life. A doctor who arrived in about 10 minutes pronounced the child to be dead. This doctor was called upon by the coroner to perform a post-mortem examination, and after doing so with some reluctance, reported that he could find no cause of death. Sir Bernard Spilsbury was then called upon to make a second examination. The only striking abnormalities were the unusual lividity of the post-mortem staining, the dilatation of the heart cavities, and the large size of the brain and thinness of the skull as if from stretching. The heart muscle was pale in colour, but on microscopic examination proved to be healthy. The air-passages had been opened at the previous examination when they were found to be free of all foreign matter. His view was that death was due to a crumb having entered the larynx and caused a "reversed reflex action" which stopped all the vital functions and more especially that of respiration. The crumb had been expelled by the cough so that it was not found in the larynx after death. Many areas of the body were known stimulation of which might cause sudden death; these included the back of the nasal passages, the larynx, the upper abdomen (two cases of sudden death from a blow on the upper abdomen were reported by Sir Astley Cooper), the lower abdomen, and the genital organs. An illustrative case was that of a man of 45, who returned to his home drunk. Knowing him to be very violent in his cups all the other inhabitants of the house fled on his approach. On their return an hour later he was found dead lying head downwards on the stairs. The speaker had performed the post-mortem examination, and though he found disease in various organs was unable to account for death until he found a large bruise in the body and head of the pancreas which suggested a blow on the upper abdomen. It was then found that one of the treads of the stairs was broken, and it was surmised that the breaking of this tread had caused the man to fall heavily upon a pillar of the banisters and thus receive a blow upon the upper abdomen which caused sudden death by inhibition. In another case a boy received a blow on the pit of the stomach while fighting and fell back apparently dead; a doctor who was called found that life was extinct when he arrived. Here again the skull was thin and the brain, and more especially the cerebellum, unusually large; it seemed as if the large brain had stretched the skull. Although some thickening of the mitral valve was found the cause of death was only traced when a large bruise was found in the diaphragm in the region of the pit of the stomach. Death was, in his opinion, due to "inhibition."

All resting muscle was normally in a state of tone, but when one set of muscles contracted in obedience to a nervous impulse the opposing muscles fell into a state of active relaxation or inhibition. In the reflex produced by the entrance of a crumb into the glottis, stimulation of the vagus first stopped breathing, then followed a large inspiration, and finally an expiration through the closed glottis, in other words, a cough. In the case of the child in whom the entrance of the crumb into the larynx caused death, he believed that death was due to arrest of the respiratory function from the spread of the inhibitory effect over a wide area of the central nervous system. Death in these cases was at first only apparent, and life could be restored by performing artificial respiration until the inhibitory effect had passed off. Dr. Spurgin's case might be similarly explained; a blow on the neck caused spasm of the glottis, thus bringing the vocal cords in contact and producing the same reflex result as a foreign particle and causing the same inhibitory effect. Blows on the upper abdomen excited a similar reflex through the fibres of the vagus in the stomach; it was noticeable that in all cases where death ensued the stomach was distended with a recent meal. In all these cases the dark colour and fluidity of the blood indicated that the actual cause of death was asphyxia.

Discussion.

Sir WILLIAM WILLCOX said that cases of sudden death where it was difficult to find a cause at the post-mortem examination usually fell under two heads—(1) those following a hearty meal followed by vomiting and the aspiration of some of the vomited material into the glottis causing sudden death due to violent stimulation of the vagus, and (2) those from immersion in water (not drowning), in which a little water entering the air-passages produced the same effect, an effect which might be heightened by the shock of the sudden immersion of the body. He suggested that vasomotor disturbances and the filling of the great splanchnic reservoir were also of great importance.

Dr. H. DRINKWATER described a death following ethyl chloride anæsthesia of a boy aged 10. The boy had apparently recovered from the anæsthetic and

had been seen by the speaker apparently quite well. About ten minutes later he was called to the recovery room and found the boy dead. Artificial respiration and cardiac massage both proved useless. The medical man who performed the post-mortem considered death to be due to status lymphaticus, but with this he could not agree. He now reported the case because in this case as in some of Sir Bernard Spilsbury's it was noticed that the brain was very large and the skull very thin.

Mr. F. B. LEVY, who prosecuted Muchmore, inquired whether the first fight between Muchmore and Murphy could have had any effect in predisposing to the latter's sudden death from one blow struck in the second.

Dr. R. M. BRONTE reported two cases of sudden death where the cause of death was other than that which might have been supposed by the conditions in which the body was found. In another case during the administration of a spinal anæsthetic the man was dead before the needle was withdrawn, apparently from fright. It transpired that he had previously expressed to his relatives the greatest dread of operation. He had also known a case where a woman had died after trying to cause abortion in herself without having done herself injury of any sort.

Dr. F. O. MARTLEY quoted the case of a man buried for many hours in a landslide, yet able to converse with his would-be rescuers, who died as soon as a heavy plank was removed from his abdomen, as illustrating the importance of splanchnic dilatation.

Dr. SPURGIN and Sir B. SPILSBURY replied.

ABERDEEN MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on March 6th, Dr. G. M. DUNCAN, the President, in the chair, when Dr. J. F. CHRISTIE gave a paper on

Tuberculosis of the Skin, with Special Reference to Lupus Vulgaris.

Dr. Christie divided the tuberculous skin affections into three classes: 1. The definitely tuberculous; where the tubercle bacillus is found in all, the classical histological appearances are present, the inoculation of susceptible animals is positive, and there is a local reaction to tuberculin. In this class are lupus vulgaris, scrofulodermia, tuberculosis verrucosa cutis, miliary tuberculosis of the skin, acute and chronic tuberculous ulcer. 2. The tuberculides; found in those who are "more or less tuberculous" and react to tuberculin. Here the histology suggests tubercle but the bacillus is only occasionally found, and it has been supposed that they are due to the circulation of toxins of tuberculous origin or to attenuated forms of Koch's bacillus. In the light of more recent knowledge, however, it must be admitted that these are forms of true tuberculosis due to the actual presence of the tubercle bacillus, but occurring in those who are putting up a good resistance to tuberculosis. The diseases in this class are thus analogous to the secondary syphilides, and include lichen scrofulosorum, the papulo-necrotic tuberculides, lupus pernio, and erythema induratum (Bazin). In these the eruptions are bilaterally symmetrical, and they tend to spontaneous cure. 3. The doubtful toxic tuberculides; including lupus erythematosus, pityriasis rubra gravis (Hebra), angiokeratoma, and psoriasiform tuberculide.

Dr. Christie then discussed the differential diagnosis of lupus vulgaris in its different manifestations—lupus simplex, exulcerans, fibroid, verrucosis, and mentioned the importance of a searching examination of the mucosa of mouth and nose as 75 per cent. of these cases present mucous membrane lesions. The diagnosis between lupus vulgaris and syphilis was particularly dealt with, and the difficulties of diagnosis in cases of these diseases co-existing were noted. The complications of lupus vulgaris were next mentioned, and in emphasising the gravity of lupus carcinoma Dr. Christie stated as his opinion that these cases were on the increase, and briefly discussed the treatment.

A full account of the treatment of lupus vulgaris was then given: general treatment by sunlight and fresh air; drugs, such as iron, arsenic, sodium morrhuate, thyroid extract, potassium iodide, tuberculin, and the arsenobenzol preparations; and local treatment by surgical measures, such as excision or curetting, freezing, X rays, Finsen light, the carbon-arc lamp, and various chemical agents, such as Brooke's ointment, acid nitrate of mercury, and trichloracetic acid. Special emphasis was laid on the necessity of long-continued treatment.

The lecture was illustrated by the exhibition of a large number of coloured plates and photographs, and by the demonstration of over 20 cases, and was followed by a short discussion.

Reviews and Notices of Books.

THE ACUTE ABDOMEN.

Diagnosis and Treatment of Acute Abdominal Diseases, including Abdominal Injuries and the Complications of External Hernia. Second Edition. By JOSEPH ADAMS, M.B., M.S., F.R.C.S., Surgeon to St. Thomas's Hospital, &c. London: Baillière, Tindall and Cox. 1923. Pp. 558. 16s.

IT is ten years since the last edition of this popular text-book was issued. The new edition has been thoroughly revised and in part rewritten, and over 20 illustrations have been added. As the author points out, more and more surgical work is being undertaken by general practitioners in cottage hospitals, and there is no doubt that a text-book of this sort will be very useful for their guidance. The first chapter is devoted to an orthodox description of the abdominal anatomy, but owing to the confines of space is of necessity very scrappy, and it is doubtful if it will serve any really useful purpose. For instance, less than a page is devoted to the lymphatics of the viscera, and the statements that the lymphatics of the stomach pass to the glands along the lesser curve, and that the rectal lymphatics end in the sacral glands are incomplete and consequently may mislead.

The clinical sections are very satisfactory. Stress is laid upon the importance of the history in arriving at the diagnosis, and the diagnostic symptoms of the individual emergencies are well and clearly portrayed, so that the work should be a very real help to those who have had but little experience of these types of lesion. The indications for treatment are also on the whole satisfactory, but a statement is twice made, in the advice given for the treatment of perforations, that the operation should be delayed if the patient is showing symptoms of much collapse. With this many surgeons would disagree, for it is now recognised that the results of operation are directly proportional to the time at which treatment is instituted. In view of recent discussions one would have hoped to see more attention paid to the value of blind cæcostomy in the treatment of acute intestinal obstruction. Although in the opinion of some authorities the treatment advocated by the author is the most satisfactory, there is a large group of cases in which a blind cæcostomy will hold out the greatest hope of saving the patient's life. It is unusual to find included in a book on acute abdominal diseases a discussion on the subject of dysmenorrhœa.

On the whole the work will be found extremely useful, and should certainly be in the hands of those who, not having large surgical practices, may suddenly be called upon to deal with an abdominal emergency. It should have and deserves a large sale to-day.

DISEASES OF WOMEN.

Fifth edition, revised and enlarged. By HARRY STURGEON CROSSEN, M.D., F.A.C.S., Clinical Professor of Gynæcology, Washington University Medical School. London: Henry Kimpton. 1923. With 934 engravings, including one colour plate. Pp. 1005. 50*s*.

OWING to the absence of the author on war service the revision of the fifth edition of this well-known work has been undertaken mainly by Dr. Hugo Ehrenfest. The book has enjoyed a considerable amount of popularity and this edition has been carefully brought up to date and is copiously illustrated and unusually complete. For example, there is included an account of the intra-uterine insufflation of gas to determine the patency of the Fallopian tubes in cases of sterility, with a full description of the technique, and the use of so-called pelvic pneumoperitoneum for purposes of diagnosis. In this some 800–1000 c.cm. of a gas such as carbon dioxide are injected into the peritoneal cavity either through the uterus and tubes, or directly through the abdominal wall, and then X ray photographs of the pelvis and abdominal cavity are taken. This is considered to be a great help in the diagnosis of such conditions as fibroids of the uterus, disease of the ovaries and tubes, especially distension of the latter, and in the recognition of the presence of adhesions in the pelvis. According to Peterson, who has done a large amount of work in perfecting this method of diagnosis, since its introduction the recognition of the exact nature of obscure conditions in the pelvis has greatly improved.

Some of the other rarer conditions of which descriptions are to be found in the book are trichomonas vaginitis, echinococcus disease of the uterus, fulminating pelvic œdema, and endometrial cysts of the ovaries. A good account with many illustrations is given of the pathology of subinvolution and chronic metritis, and the microphotographs of the differentially stained sections of the two conditions are most helpful. We notice that there is no mention of leukoplakia vulvæ in the index and find that the author describes this condition as a variety of kraurosis vulvæ. He evidently does not allow the distinction which is so commonly drawn at the present day between these two conditions or the fact that while the former appears to be a common precancerous state the latter seldom ends in that disease. The book contains a great deal of information not commonly found in text-books of gynæcology, and for this reason among others fills a definite place in the literature of the subject.

DYSENTERY IN THE FEDERATED MALAY STATES.

By WILLIAM FLETCHER, M.D., Bacteriologist, Institute for Medical Research; and MARGARET W. JEPPS, Protozoologist, Institute for Medical Research, Kuala Lumpur. London: John Bale, Sons and Danielsson, Ltd. 1924. Pp. 82. 10*s*. 6*d*.

WE have recently had occasion to draw attention to the instructive series of studies being issued from the Institute for Medical Research, Kuala Lumpur. The present volume fully maintains the standard of its predecessors. It deals with the ætiology, pathology, and treatment of dysentery as it occurs in the Malay States. The attention of the authors was immediately drawn to the remarkable contrast between the mortality-rate in Europeans and Asiatics: amongst the former two deaths from this cause have been recorded in the last three years. The mortality-rate amongst paupers, especially the half-famished malaria-infested Indian labourers, was as high as 26 per cent.; this, undoubtedly, had to be ascribed to the condition of the patients, not to any special virulence of the disease. Bacillary dysentery, then, is a disease of poverty. Taking the average weight of a healthy Tamil coolie as 112 lb., it was found that those who died had lost one-third of their body-weight, while in one extreme case the man weighed 3¼ st. Chronic malaria and atrophy of the internal organs, consequent on starvation, are held responsible for the loss of recuperative power. No evidence was obtained that malaria per se was responsible for dysenteric symptoms, or that lack of food or inability to assimilate it was responsible for beri-beric symptoms, but at the same time xerosis and pellagra occurred. As regards the ætiology, Flexner's bacillus was found to be 18 times as common as the Shiga organism. Double infections of amœbic and bacillary dysenteries were found, mostly at autopsy, in 13 per cent. of cases. As a general rule a fatal bacillary attack took place in the course of an amœbic infection. The carrier state in bacillary dysentery was found to be due to collections of these organisms lurking in ulcers, fissures of the mucous membrane, as well as in retention cysts.

It is satisfactory to note that much information recorded by British workers during the war has been fully confirmed. We may mention the employment of cytological methods, the failure of routine emetine treatment, and the vitality of the dysentery organisms in the fæces. Treatment with anti-dysenteric serum in debilitated natives was unfortunately found to be unsatisfactory, while vaccines injected appeared to be quite inert.

X RAYS.

Their Origin, Dosage, and Practical Application. By W. E. SCHALL, B.Sc. Lond., F.Inst.P. Bristol: John Wright and Sons, Ltd. Pp. 119. 5*s*.

THIS book should prove of considerable service because it gives a lot of quantitative information, and medical radiologists, as well as others interested in X ray matters, now have frequent recourse to numerical data in the current forms of therapy. The scope of the book is wide, in fact, perhaps, this is its chief weakness, for no one could treat adequately the subjects discussed in limited space. The author would, perhaps, have done well to omit that section which deals with the results of clinical treatment. Such matters can only be discussed in detail, but the author has had to fall back upon the statements of a certain limited number of people, and it is not in this way that general conclusions can be reached. In the technical and descriptive sections of the book the author is able to draw upon his own experiences, which have helped him to select most useful data and information. The first four chapters are devoted to the origin and properties of X rays, the apparatus necessary for their production and control, and the instruments in current use for measuring X rays. Then follow two chapters upon the practical applications of the rays in diagnosis and therapy. Not the least important part of the book is the collection of numerical tables which occupy the last fifteen pages. The book is well printed and illustrated by good line diagrams. It is a volume which will be useful to every radiologist.

UROLOGY.

Urologisches Praktikum. Second edition. By Prof. I. COHN, Berlin. Berlin: Urban and Schwarzenberg. 1924. Pp. 399. Swiss Fr. 11.25.

THIS manual is for students and practitioners rather than for the specialist surgeon. There are two large initial sections, one of which deals with urinary investigation methods, and the other with general symptoms such as pyuria, difficult micturition—an arrangement which is followed in a few English manuals of this class. Then follow chapters on the diseases of the several constituent parts of the urinary tract. The teaching all through, with few exceptions, conforms to English practice, and the information seems very reliable. The country of origin is labelled by the fact that much prominence is given to cryoscopy and indigo-carmine injections in investigating renal function. Phenolsulphonephthalein is said to have no advantage over indigo-carmine, but it is surely more easily estimated quantitatively. The urea-concentration test as we know it is not mentioned. It is to be noted that the author has obtained good

results from a modified Bottini operation in certain selected cases of enlarged prostate. This section on the enlarged prostate is systematically treated. The author regards pyelography as dangerous, but practically all risk has been eliminated by modern technical methods. He finds air distension of the bladder a useful diagnostic method, and it might certainly be used more often in this country with advantage. There are a number of very truly reproduced coloured endoscopic pictures of bladder and urethra.

The book can be recommended as a reliable guide to the inquiring student or practitioner.

QUANTITATIVE CHEMICAL ANALYSIS.

Twelfth edition. By FRANK CLOWES, D.Sc. Lond., Emeritus Professor of Chemistry in University College, Nottingham; and J. BERNARD COLEMAN, A.R.C.Sc. Dub., Head of the Chemical Department, Chelsea Polytechnic, London. London: J. and A. Churchill. 1924. Pp. 576. 18s.

IN something the same way as the name of Gray at once occurs to the mind when books on human anatomy are mentioned, this classical volume is associated closely with the subject of quantitative chemical analysis. From the publication of the first edition in 1891 to the present time it has been regarded as a standard work on the subject. The first chapters are devoted to descriptions of balances and how to use them; then follows a detailed practical description of all the well-known pieces of apparatus used in the subject. After these necessary preliminaries have been mastered by the student, he is taken through a complete course of analysis, the estimation of almost every inorganic element being described. The analysis of fats, oils, tannins, and soaps is dealt with, and there is a very fine section on the ultimate analysis of organic compounds. The chapter on gas analysis is rather out of date, and it is somewhat surprising that no account of Haldane's methods are given.

The new edition will be welcomed by many, and it is certain that the work will retain its high place in the literature on quantitative analysis.

JOURNALS.

THE BRITISH JOURNAL OF CHILDREN'S DISEASES. Vol. XXI. January–March.—In an article on "Idiopathic" Hypertrophy of the Bladder, by Dr. A. Dingwall Fordyce and Dr. Norman B. Capon, with a pathological report by Prof. Ernest Glynn, the writers review the literature and record two illustrative cases in children, aged 12 and 16, in which there was no tangible or obvious cause for the condition found during life or post mortem. During life the clinical picture resembled that of chronic interstitial nephritis in the large flow of albuminous urine and the marked renal inefficiency. On physical examination a globular hypogastric mass was found which was the hypertrophied bladder. The necropsy showed hypertrophy and dilatation of the bladder and dilatation of the ureters and renal pelvis, with cyst-like dilatation of the kidney tissue. The condition resembled pyloric stenosis, idiopathic dilatation of the œsophagus, and Hirschsprung's disease, for all of which there is probably some neuropathic basis. The paper is accompanied by numerous excellent macro- and micro-photographs.—Dr. H. S. Hutchison and Dr. Grace Stapleton contribute the first part of a paper on Late Rickets and Osteomalacia, in which they discuss the clinical position of puerperal osteomalacia, their conclusions being as follows: Pregnancy does not cause changes differing in any way from those occurring apart from pregnancy. There are the same incidence and occurrence, the same clinical signs, and the same radiological picture, irrespective of the occurrence of pregnancy. Osteomalacia may occur in men, so that pregnancy cannot be regarded as a necessary ætiological factor, but merely as a contributory factor.—Dr. Grace H. Anderson also contributes the first part of a paper on the Calcium and Phosphorus Content of the Blood in Normal and Rachitic Children, in which she concludes that though the blood-calcium is slightly more variable in rachitic than in normal children, the variability has no diagnostic or prognostic value, so that a study of calcium values alone is unlikely to prove of much assistance as an indication of cause or treatment.—In a paper entitled Anæmia with Enlarged Spleen in Infancy: "Infantile Splenic Anæmia," Dr. Grenville W. St. C. Ramsay reviews the literature and records his observations on 45 cases, which are classified as follows: (1) 27 showed all the features which are generally considered essential to justify a diagnosis of infantile splenic anæmia, such as anæmia, degenerative and regenerative forms of red cells, myelocytes in the peripheral blood, and enlargement of the spleen. (2) In 12 cases the blood picture was complete except for the presence of myelocytes. The spleen was enlarged in all. (3) In six cases the blood was typical, but there was no enlargement of the spleen. The writer concludes that the so-called infantile splenic anæmia is not a disease *sui generis*, but is a form of simple secondary anæmia.—Dr. Robert Hutchison and Dr. Gladys M. Wauhope report a case of Precocious Puberty in a girl aged 3½ years, in whom menstruation began at the age of 18 months. The period lasted for two or three days, and returned at regular intervals of 28 days, except on three occasions, when the interval was exactly two months. After the child's third birthday the intervals became irregular and of longer duration. Pubic hair was noticed at the time of the first period. The breasts were well formed, but no definite date could be given for their enlargement. On abdominal and bimanual examination under an anæsthetic both ovaries were palpable and of normal size. X ray examination of the skull showed no sign of tumour or other abnormality, but skiagrams of the skeleton showed a bony development usually present about puberty. The writers discuss the causes of precocious puberty—viz., hypernephromata of the suprarenal cortex, tumours of the pineal gland, and tumours or hyperplasia of the gonads, and came to the conclusion that the precocity in their patient was due to ovarian hypersecretion.—The abstracts from current literature are devoted to diseases of the blood.

New Inventions.

AN IMPROVED ABDOMINAL SUPPORT.

THE appliance here illustrated has been designed to give an efficient support to the lower abdomen, and to carry the weight of the abdominal viscera in intestinal stasis, enteroptosis, and lower abdomen post-operative cases, and at the same time to be comfortable to wear. The support consists of a single leather-covered and padded aluminium front and back plate with rubber pneumatic cushions, connected

by two lateral steel springs, hinged to, and sprung, or levered about, the lateral edges of the back plate, the right spring being detachable in front. The advantages are: (1) No pressure is exerted anywhere except on the front and back plates. The springs barely, or only lightly touch the body; this result is obtained by the leverage on the springs over the edges of the back plate when the support is in position on the body; this leverage also practically converts the appliance into a single-spring support, and so

necessitating a lighter spring than usually employed. (2) The back plate is centrally placed, and is padded to avoid pressure on the spine, and cannot press upon or bruise the gluteal muscles or large sensory nerves crossing the buttocks. (3) The attachment and release is easy to manipulate and under the direct view of the wearer. A simple partial release is fitted, easily adjusted without undoing the clothing, making it comfortable to sit or recline for long periods. (4) The appliance is light in weight and has 2¼ inches of adjustment.

The support is made and supplied by Messrs. W. H. Bailey and Son, 45, Oxford-street, W.

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The Conduct of Medical Practice.

A Series of Articles by Experts dealing with the Difficulties Encountered in Professional Life and How to Meet Them.

XIII.

LEGAL ASPECTS OF "DICHOTOMY."

BY A SOLICITOR.

Guise: "He that will be a flat dichotomist . . .
"Kill him!"
Ramus: "Oh, good my lord,
"Let me but speak a word."
—Marlowe, *Massacre at Paris*, Act I., Sc. 8.

IN a recent issue[1] was recorded the unanimous condemnation of fee-sharing by a meeting of consultants and specialists in a large provincial centre. The practice of "dichotomy," or secret fee-sharing, between a consultant and the general practitioner who has called him in, has medical aspects on which I am not competent to write. The practice has also legal aspects of a serious kind. Naturally the facts differ in each case, but we will suppose that a patient is attended by a general practitioner who advises an operation or a consultation, that the patient accepts the advice and leaves it to the practitioner to arrange for the services of the operating surgeon or consultant at a particular time, place, and fee, and that the operating surgeon or consultant, on being paid his fee, hands part of it over to the practitioner behind the patient's back. At once the following legal consequences result. If it be right to speak of the practitioner as having been the patient's agent (a point which will be returned to presently) the agent has taken a surreptitious profit in the course of his agency. An agent must not enter into any transaction in which he has a personal interest in conflict with his duty to his principal, unless the principal is fully informed and consents. If the patient is unaware of what is going on behind his back, he may, when he finds out the facts, insist that the practitioner (as his agent) shall account to him for the secret profit he has received. The agent must hand it over to the patient who otherwise can bring an action for the return of the money.

Possibly the practitioner and the consultant would plead in defence that such fee-sharing was a trade usage. For this plea to succeed, the court would have to be convinced that the practice was reasonable and that it was not only common but general. There is little doubt that the practice would not be held reasonable, for it alters the nature of the contract between patient and consultant without the knowledge of the former, and it gives the agent an interest in conflict with his duty to his principal.

Civil or Criminal Proceedings.

Thus far the reference has been to the legal aspect in civil proceedings. But dichotomy has a criminal aspect too. Under the Prevention of Corruption Act of 1906 "if any agent corruptly accepts or . . . attempts to obtain . . . any gift or consideration as . . . reward for showing any favour to any person in relation to his principal's affairs or business," he is guilty of a misdemeanour punishable with a fine up to £500, or imprisonment up to two years' hard labour. Might not a jury be asked to consider that the practitioner is showing favour to a particular consultant if he recommends to the patient, and procures the services of, one from whom he has the expectation of receiving, and perhaps on similar occasions previously has actually received, a kind of secret brokerage or commission? A corresponding offence under the Act is committed by anyone who gives money to the agent in these circumstances. Finally, it might be possible to frame an indictment under another part of the Act if the giving or showing of a receipt for the consultant's full fee could be proved to have deliberately misled the patient into the belief that the full fee had been properly received and represented a bona fide transaction.

The crux in the legal position is the question whether the practitioner acts as agent of the patient in obtaining the services of, and making the necessary arrangements with, the consultant. This is a question of fact. Agency may be inferred from the conduct of the parties. An agent is a person employed to bring the employer into legal relations with a third party. It is true that, in authorising his doctor to obtain for him the services of a consultant, the patient is asking the doctor to do something for him gratuitously. But dichotomy puts an end to the gratuitous element in the transaction. Moreover, where the transaction is gratuitous, the only legal difference is that the parties may have no legal remedy if the transaction is not carried out at all—i.e., if the consultant's services are not obtained. As soon as the transaction is under way and the patient meets the consultant, the question whether the agency was gratuitous or not becomes immaterial. Again, the patient may pay the consultant direct, but that fact does not negative the inference of agency. And, at any rate in the criminal statute which we have quoted, there is a wide interpretation of agency. An "agent" is defined as including "any person employed by or acting for another." The position of a defendant would be even more serious in a panel case, for the amending Act of 1916 provides that if money has been paid to, or received by, a person in the employ of a Government department or a public body, the transaction is presumed corrupt unless the contrary is proved.

No Legal Analogy.

No analogy from the legal profession can be craved in aid. A busy barrister sometimes (but by no means always) gives a part of his fee to another barrister who has "devilled" a case for him. Here there is no element of agency, for the recipient had nothing to do with the engagement of the barrister's services. If one could imagine a solicitor employing a barrister at a fee of 50 guineas with a secret understanding that the barrister should hand 5, 10, or 20 guineas back to the solicitor behind the client's back, or if one can imagine dichotomy between a general practitioner and the chemist who makes up his prescriptions, one gets a truer analogy. The gist of the offence is the improper secrecy. The effect of secret fee-sharing on the relations between the medical profession and the public is easily imagined. It must inevitably suggest that the consultant's fees are artificially and unjustifiably raised in order to provide a margin to cover the secret commission, that the patient is deprived of the genuinely disinterested advice he expects from his medical attendant, and that members of the medical profession are not above petty conspiracy to hoodwink the persons who pay for their services. It is fair to say that proceedings under the Prevention of Corruption Act are seldom successfully taken, owing to the difficulty of obtaining sufficient evidence. But for a medical man even to be acquitted on such a charge would hardly be edifying, and, if there be any doubt about the law, a practitioner will hardly desire to give his name to a leading case on the subject.

[1] THE LANCET, March 8th, 1924, p. 517.

THE LANCET.

LONDON: SATURDAY, MARCH 29, 1924.

MEDICAL EDUCATION IN CAIRO.

THE Royal School of Medicine at Cairo, formerly known as the Egyptian Government Medical School, and still better as the Kasr-el-Ainy Hospital and School, is an institution with a long and chequered history. Founded in Napoleonic times, afterwards fostered by MAHOMED ALI, it has languished from time to time, to revive under some foreign tutelage, which has been at various times, French, Italian, and British. Under the last two British directors, Dr. H. P. KEATINGE and Mr. OWEN RICHARDS, it has reached a high state of efficiency and developed into an important centre for medical education, being the only one in Egypt. The School is under the direct control of the Minister of Education, but the Under-Secretary of State for Public Health is also concerned in the administration of the hospital. The entry is limited to a hundred new students each year, selected from the successful candidates at the examinations for the secondary education certificates in science. The curriculum for the diploma of the Royal School of Medicine at Cairo has hitherto been approved by the Conjoint Board of the English Royal Colleges, who send a visitor to the examinations, which are conducted in English. The diplomates of the Royal School of Medicine are allowed to proceed direct to the final examinations of the Conjoint Board when they come to this country, a privilege which has been extensively used by Egyptian practitioners coming here to work for higher qualifications. The school at Cairo is well equipped and is staffed by a number of professors, who until recently have been mostly of British nationality with Egyptian assistant professors and demonstrators, although the chair of parasitology was formerly occupied by a German, Prof. ARTHUR LOOSS, who made very distinguished contributions to the literature of his subject. The clinical material at the hospital is almost unrivalled. There is an average daily attendance of nearly a thousand patients in the various out-patient clinics. Unfortunately, the hospital buildings are old and incapable of further extension or adaptation, with the result that the arrangements in the hospital are cramped, unsatisfactory and unworthy of the school. We understand that plans were in preparation for a new and up-to-date hospital near the school, but for some reason this scheme has not yet been put into execution. The present flourishing state of the school is without doubt due to the good work done by the English professors in the school and hospital with the loyal coöperation of their Egyptian colleagues, and special attention is given in the curriculum to subjects of importance in Egyptian practice, notably ophthalmology, parasitology, forensic medicine, and public health. A large proportion of the successful students enter the Government service, so that their familiarity with these subjects becomes of national importance.

Some time ago clinical units were established in medicine and surgery, and at the time Prof. H. B. DAY and Prof. R. V. DOLBEY are whole-time directors in charge of these units respectively. With their coöperation we have published in THE LANCET recently a number of original papers from the staff of the Kasr-el-Ainy Hospital showing what use is being made of the valuable material there available for research. The work of Prof. DAY [1] in the treatment of ankylostomiasis and bilharziasis is of great importance and has formed the basis of a concerted effort to deal with these parasitic infestations, from which it is calculated that at least 70 per cent. of the fellaheen suffer. His articles are well worth careful study as they are clear and practical, giving full details of the methods employed. An Egyptian lecturer on parasitology, Dr. KHALIL, has now been appointed, and he is engaged in research into the numerous problems presented by parasitic diseases in Egypt. Mr. F. C. MADDEN, the professor of surgery in the School, has published a valuable text-book on the Surgery of Egypt, which is admirably illustrated and covers well the field of surgical disease in Egypt.[2] We have tried in the contributions from the School published in our columns to bring these and other activities clearly before our readers. Among the papers on surgical subjects, which have been published in our columns, we may mention that of ALI BEY IBRAHIM on bilharziasis of the ureter,[3] and that by Prof. DOLBEY and IBRAHIM FAHMY on bilharzial papillomatosis of the rectum. In the latter the treatment of the condition by the operation of removal of the whole tube of mucous membrane of the rectum is described and illustrated. Probably few practitioners in this country have seen a case of hydrophobia. The paper by Prof. DOLBEY and Dr. ABDULLAH EL KALIB on hydrophobia in Egypt gives a striking account of this disease as seen in Egypt. We may also refer to the paper on the incidence of cancer in Egypt published in last week's issue of THE LANCET by Prof. DOLBEY and Mr. A. W. MOORO, as it contains some suggestive observations and indicates that there is scope for some original work on this disease in that country. The various papers to which we have referred show that the importance of original work and research is being recognised at the Cairo School. We may venture to hope that work of this kind will be encouraged there as it should serve to enhance the reputation of the school.

The alteration in the national status of Egypt and the recent political changes will doubtless have their repercussion upon the Royal School of Medicine. At present, the director, the two whole-time clinical professors, all the professors on the early subjects, and the senior member of the visiting staff in the three branches of medicine, surgery, and obstetrics are of British nationality; as until recently was also the professor of ophthalmology. Changes are already in progress, and there is no doubt that the policy of the Egyptian Government will be similar to that followed in other of the Government institutions—namely, the replacement of British members of the staff by Egyptians. No one denies the danger that such alterations may be made too quickly. Sudden changes are frequently disruptive and disorganising. The present state of the School is one of promise, provided it is equipped with an adequate hospital and guided wisely during its period of transition. Given such conditions it should develop into the most important centre for medical education and research in the Middle East. A too narrow interpretation of national aspirations might have the reverse effect and restrict the school to a very limited field with the loss of its recently won European status and recognition.

[1] THE LANCET, March 1st, p. 435; and 1921, i., 525.
[2] The Surgery of Egypt, 2nd edit., Cairo, 1922.
[3] THE LANCET, Dec. 8th, 1923.

CLINICAL RESULTS IN DEEP X RAY THERAPY.

SINCE the action of the X rays upon new growth cells was first observed continuous efforts have been made to treat successfully various forms of cancer. The degree of success has varied with different workers, and up to quite recently the work has been empirical in nature. Within recent years the treatment of cancer by X rays has received fresh stimulus from the published results of continental workers, notably those working at Erlangen; and all over the world radiologists and clinicians have tried to repeat these results, using in many instances the same form of apparatus and tubes, and as nearly as possible the same technique as that described by the continental writers. The question of technique is an important one, for the original Erlangen technique required for its execution an infinite amount of detail work; and it has been argued that the absence of any one of these details might reasonably be accountable for failure. It is obvious that if a test of the method is to possess any value the carrying out of the treatment must be done in exactly the same way as in the original.

This has not always been done. The discussion at the Royal Society of Medicine on March 21st, and reported on p. 649 of our present issue, was opportune in that, before a large gathering of radiologists and clinicians, the results of treatment received full consideration; a number of workers who had followed the original technique gave their experiences and results obtained in the treatment of a large variety and number of cases of malignant disease. There can be no doubt that the hope of curing cancer by the more intensive treatment, made possible by the production of more powerful apparatus and tubes, has induced many workers to enter the field, and to treat cases sometimes with greater enthusiasm than judgment, the consequence being that disastrous results have before now ensued. In this connexion the important point was made by several of the speakers that only selected cases, in which a chance of relief or cure could be looked for, should be subjected to the great physical strain of a complete intensive treatment; and it was frankly admitted that many of the cases which had undergone treatment in the past were quite unsuitable on account of cachexia, or a relatively low blood count. Brief reference only was made to the undoubted danger of over-exposure and its sequelæ, X ray burns and asthenia. The question of the single large dose and the divided dose in the treatment of carcinoma was fully discussed, arguments being advanced on both sides. There is little doubt that the divided dose, even if it has to be carried somewhat further in the aggregate than the single dose, is preferable, because of the lessening of the strain upon the patient. In actual practice it is found that results can be obtained which are quite as good as any so far produced by the single large dose.

After careful consideration of the large amount of clinical material available, the fact stands out clearly that a great advance in technique has been made in recent years in the treatment of malignant disease. Thus it would be unfortunate if the value of this advance should be lessened by an undue magnification of the failures in the results obtained by over-enthusiastic and possibly inexperienced workers. Such a sequence appears always upon the advent of a new technique, or the improvement of an existing one. The crucial test of radiotherapeutic measures will inevitably be the measure of the success obtained in the treatment of cancer; and in this direction it is obvious that the test is a severe one, particularly as up to the present in this country, at all events, the failures of other methods are handed over to the radiologist as a last resort. The critical test would require to be applied not to a hopelessly inoperable case of cancer, but to one which offers an equal chance of cure to either method of treatment. Nor should the radiologist alone be responsible for the case. A selected team of experts should watch the progress of the case during treatment. The observations of such a team working in accord would be of the greatest possible value in our estimate of the whole position. In radiation we possess no specific cure for cancer. Until we know more of the intricate changes in cellular growth and the changes occurring in morbid conditions it will be useless even to contemplate the possibility of a specific cure. A great deal of experimental work must yet be done before the biological processes of cell growth and the response to radiation can be understood.

The needed organised research should include the services of the clinician, the biologist, the biological chemist, the morbid histologist, and the radiologist. The assistance of the physicist will also be required for the elucidation of problems of physico-biological interest. The patient must be the first consideration in all attempts at cure by radiation or allied measures. Treatment should be carried out on rational lines, which are evolved from a consideration of physiological and pathological processes. If a very long exposure is contemplated, then all steps should be taken to ensure that the patient is in a fit condition to stand the strain. A careful consideration of the pathological processes at work, the condition of the tumour, the type of cell composing the bulk of its structure, and the state of the surrounding tissues, will in a large number of cases rule out at once any hope of a cure: the treatment must then become palliative, and in this group there is a large field for the radiotherapist. In an inoperable case of cancer combined treatment is the most rational procedure. The diathermy current will be found to be most useful in any such combination, while radium and X rays may be used singly or in combination. Fresh air, good food and tonics help toward the improvement of the patient's condition, aiding the action of radiations often to a marked degree. If treatment be carried out along these lines it will be found that occasionally an inoperable tumour will be so reduced in size that the possibility of operation can be considered; still more rarely a tumour entirely disappears and the patient is restored to normal health. The choice between surgical removal and radiotherapeutic measures, in a case of early cancer, does not at the present time exist; with average risks from the operation, there is no doubt that surgery is preferable, and most experienced radiologists are in agreement on this point, although at the moment it deprives them of the opportunity of applying what we called above the critical test. The value of prophylactic treatment was discussed by several of the speakers at the discussion on March 21st; this, in our opinion, should always follow surgical removal of malignant growths. Cases could be quoted, and are quoted, in which recurrence has taken place very soon after the commencement of prophylactic X ray or radium treatment. This may be difficult to explain, but the fact that a very large number of cases have recurred soon after operation is not an argument against operation in the majority of cases. A more cogent fact is that superficial recurrence has been temporarily cured in a con-

siderable percentage of cases treated by X rays, and this in itself is sufficient ground for continuing their application.

THE OPERATIVE TREATMENT OF CANCER OF THE LARYNX.

OPINION has not yet definitely crystallised on the subject of the most satisfactory methods of removal of cancer of the larynx in its various stages and in the various degrees of involvement of the organ. For most forms of extrinsic growth, and for intrinsic growths which have become extensive, it is generally agreed that total laryngectomy offers the only hope of cure; but a considerable difference of opinion still exists as to whether cases of early cancer confined to a vocal cord, or even to a part of it, should be submitted to laryngectomy, or whether in such cases the far less mutilating operation of thyrotomy, or laryngofissure, is sufficient to provide a really good prospect of eradicating the disease. The operation of thyrotomy, which was largely developed by the work of SEMON and BUTLIN, has been far more in favour in this country than abroad. Sir STCLAIR THOMSON has reported a series of 38 cases with one death from operation and but nine recurrences, and in America CHEVALIER JACKSON, in a series of 42 cases, had no immediate mortality and only five recurrences. Such results are surely as good as those for cancer operations in any part of the body, and, when one considers that the voice is usually very fair and that no other disability results, it might be expected that the question would have been definitely settled in favour of this operation.

In an interesting article in the last number of the *Journal of Laryngology* [1] Dr. J. E. MACKENTY, of New York, prefers a strong plea for the operation of laryngectomy for cases of early laryngeal cancer. Since 1917 he has rejected all cases of extrinsic cancer for the good reason that, during several years of surgical effort, he had not succeeded in ultimately saving one. But it is the question of the early cases which we are here considering. Three of his cases were in a stage so incipient that the mobility of the involved cord was normal in two and but slightly impaired in the third; the neoplasm in all three occupied from one-quarter to one-third of the extent of the cords, leaving apparently normal tissue both in front and behind the growth. Nevertheless, they were submitted to laryngectomy. Dr. MACKENTY is quite convinced that the opinion of the majority would have condemned the radical procedure in these cases, "so wedded are laryngologists to conservatism in the treatment of laryngeal cancer"; and he is certain that careful microscopic study of the three larynges gave conclusive evidence that no partial operation would have saved the victims from recurrence. In two the areas of malignancy extended into the angle of the anterior commissure, and in the third it extended in both directions, stopping just short of the arytenoids and the anterior commissure. In contradistinction to this, Sir STCLAIR THOMSON states in his book on "Diseases of the Nose and Throat" that good results are even obtainable if the disease has spread across the anterior commissure, so that all one cord and a portion of the other have to be excised; and he gives an illustration of such a case treated by thryotomy and free from recurrence eight years after operation. So that it is doubtful whether Dr. MACKENTY'S proof is really conclusive. The operative results of his laryngectomies are very good, with a surgical mortality of less than 2½ per cent., and he lays stress on the fact that many of his patients are leading useful and strenuous lives in business and professional careers.

In the same issue Mr. J. S. FRASER and Mr. DONALD WATSON, of Edinburgh, report on 14 cases of intrinsic cancer of the larynx. They conclude that thyrotomy is only indicated if the cord is still fairly movable and if the growth does not transgress the anterior commissure or reach the vocal process, and they point out the tendency to infiltrate between the thyroid and cricoid cartilages. In the larynx, as elsewhere, the chief hope at present lies in early diagnosis and early operation, and we would endorse the latter authors' conclusion that "They would like to see a notice in large type sent to all general practitioners as follows: Every case of hoarseness which lasts more than a few days should have the larynx examined. If you can't do it yourself, send the patient to someone who can."

[1] Journal of Laryngology and Otology, February, 1924.

THE AVAILABILITY OF PHYSIOLOGICAL KNOWLEDGE.

THE present plethora of scientific progress has its difficulties as well as its gains. It is by no means easy, and is becoming progressively harder and harder, for a man to gather in from all the varied lines of advance the items which are germane to his particular interests. And it is often from these side lights that he gets most illumination. Men like SYDNEY RINGER could know all about physiology as well as clinical medicine. Indeed, such a possibility was open to any industrious and retentive intelligence up to about 25 years ago. But no one could do it nowadays; it would be an appreciable part-time job for anyone to survey the contents of the journals of the sciences, which, though immediately connected with medicine, have not yet attained their majority. We print in another column a letter from Dr. T. LUMSDEN putting forward cogently the difficulty of securing that the progress of anatomical and physiological knowledge shall be reflected in any clinical work to which it may be applicable. The difficulty is a real one; many of our readers are possibly unaware of Dr. LUMSDEN'S own investigations on the location of the various respiratory centres in the medulla and pons which have appeared during the last 12 months or so in the *Journal of Physiology*. And in the end the difficulty is a very old one, for it is the difficulty of knowing all about everything.

Nevertheless, a good deal might be done to diminish the difficulty. Anatomists, physiologists, biochemists, geneticists, and so on, can of their own initiative do little; they do not know what particular topics are of interest to the clinician, and if they have been duly attentive to their own studies they will find that in the 10 or 20 years which have gone by since their own experience of the wards—if, indeed, they have had such experience at all—clinical problems have greatly changed. It must rest with the clinician to extract for himself what is of moment to himself; he alone knows the problem which interests him and can appreciate which pieces of information are of value in that particular connexion. How to know what information is available is the real difficulty. Dr. LUMSDEN suggests that the clinical journals might publish more in the way of reports on scientific progress, and that the Royal Society of Medicine might have sections for the ancillary medical sciences. Both projects would probably be useful, though some might doubt whether the people concerned will put up with any more meetings than are held at present, and it is possible that a section of physiology, for example, would be frequented only by physiologists. On the whole we should attach more importance to improvements in the available current literature. The new American journal *Medicine* provides admirable reviews by experts which deal, despite the title, almost entirely with what is ordinarily called physiology or pathology. The *Physiological Review* again covers in much the same way topics which, mostly physiological, range into such medical subjects as the ætiology of rickets. It should certainly be possible for the clinical journals to report to their readers the titles of the monographs which appear in these two most useful publications; the originals are available at the libraries if they happen

to be wanted, and some, at any rate, of the papers in *Medicine* are republished and may be bought separately. In rather a different category come the abstracting journals with short accounts of original papers only roughly classified. The most obviously useful to English clinicians is *Physiological Abstracts*, which appears every two months; an hour would suffice to run through the pages and learn if mention is made of anything of particular interest to a particular reader. The trouble about this admirable magazine, skilfully guided through its early years by the zeal of Prof. W. D. HALLIBURTON, is that it will come to an end next year unless it receives a measure of support more equivalent to its virtues; perhaps a wider circulation among clinical workers would be enough to save it.

These are specialised publications which in their several ways would help to realise Dr. LUMSDEN'S ideal if clinicians are keen enough to keep in touch with them. And other branches of the natural sciences have journals more or less in correspondence. No one can be on all the advancing fronts simultaneously, and it would need a good deal of assiduity to apprehend the summaries of what is going on in each place. But an earnest worker can always do his best.

Annotations.

"Ne quid nimis."

JONNESCO'S OPERATION FOR ANGINA PECTORIS.

SURGEONS, in devising new operations, often provide anatomists and physiologists with fresh and very practical problems. Why should Jonnesco's operation of removing the middle and lower sympathetic ganglia of the neck relieve the pain of angina pectoris? A paper by Mr. R. C. Shawe, which we publish this week, helps us towards an explanation. He has discovered that in the sympathetic twigs which join the vagi and recurrent laryngeal nerves at the junction of neck and thorax there are medullated nerve fibres of various sizes. The fibres of large size he has followed to the cardiac and aortic plexuses, and rightly infers that they must serve as channels for afferent or sensory impulses concerned in the reflex control of the heart. If we suppose that these lower cervical sympathetic twigs are the pathways by which abnormal impulses reach upper dorsal centres of the cord and there give rise to anginal radiations, then we have a satisfactory explanation of the rationale of Jonnesco's operation. The same twigs apparently serve as pathways for secretory fibres to the thyroid gland. Mr. Shawe's communication will serve to remind the rising generation of medical men how much there is still to be done in unravelling the structure and function of the great sympathetic plexuses of the thorax and abdomen and how practical the results are which will issue from investigations of this kind. Mr. Shawe acknowledges indebtedness to Prof. J. S. B. Stopford, the occupant of the chair of anatomy in the University of Manchester, who has demonstrated how successfully anatomical and clinical methods of research can be combined. Dr. James Ross, the founder of the neurological school of Manchester, was a physician; his work was continued by a surgeon—the late Sir William Thorburn; and in continuing and furthering researches into the structure and nature of the nervous system the anatomist has returned to his proper rôle in medicine.

IMPROVEMENTS IN OPTICAL EQUIPMENT OF OTO-LARYNGOLOGISTS.

The last number of *Acta Oto-Laryngologica* (vol. v., fasc. 4, 1924) contains ten original articles, seven of which deal with improvements in the optical equipment of the oto-laryngologist. Austrian, French, German, and Swedish specialists have written these papers which show how much the recent work of Gullstrand, Holmgren, and others has done to facilitate the examination at close quarters of objects hitherto imperfectly seen in the respiratory passages and ear. It is a very remarkable fact that though binocular vision was much appreciated in the 'sixties and 'seventies of last century, its value came almost to be forgotten, and laryngologists were satisfied during the past half century to use only one eye at a time. The average housewife, familiar with the difficulties of threading a fine needle with the help of only one eye, could have told them how badly they were handicapped. According to Dr. Carl von Eicken, of Berlin, the inventor of the binocular system of lenses for throat, nose, and ear specialists, many physicians remain under the impression that they are using both eyes when examining the interior of the ear, nose, and throat. One of the most interesting optical instruments described is the relascope, which enables the wearer to enjoy binocular vision, and two other observers, one on each side of the wearer, to look through its side windows and to see with monocular vision the same object that the wearer of this instrument is seeing and operating on. The teaching value of such an instrument is obvious. Other instruments described are the spectacle magnifier of Gullstrand, a binocular telescopic lens, an otomicroscope, and glasses to protect the operator's eyes from spurting blood and pus. A paper by Prof. G. Holmgren, of Stockholm, shows to what practical purposes recent improvements in optical instruments can be put in this field. With the help of a binocular microscope, he has recently operated on four cases of otosclerosis, the labyrinthine capsule being incised under the microscope with a degree of precision which would have been impossible without such control. In three of the four cases his attempts to make an artificial window in the labyrinthine capsule achieved a certain degree of success, auditory perception being improved, and no permanent injury inflicted on the neighbouring structures. Such operations for otosclerosis must, in Prof. Holmgren's opinion, be still regarded as in the experimental stage, but it is already evident that the prospect of their becoming perfected is greatly enhanced by the important advances recently made in optical instruments.

AUTOPSIES AND DEATH CERTIFICATION.

THE scientific value of a death certificate unsupported by the evidence of a post-mortem examination was the subject of a recent discussion[1] at a meeting of the Medical Society of Berlin, and, as might have been anticipated, the unconfirmed clinical diagnosis was severely criticised. One of the speakers, Dr. Lubarsch, deplored the fact that the present campaign in favour of economy was invading even the post-mortem room, and he insisted that the curtailment of post-mortem examinations could not be regarded with equanimity by any who were interested in public health. To show up the incorrectness of the Prussian mortality statistics not based on a post-mortem examination, he compared them with certain necropsy statistics. According to the Prussian mortality statistics, there were 922,350 deaths in 1920, of which 52,476, or 5·6 per cent., were due to cancer, and 5531, or 0·6 per cent., were due to other new growths. In only 5 per cent. of all the deaths had a post-mortem examination been conducted, and among the necropsies performed in the two-year period 1920–21 in the hospitals throughout Germany, there were 8301 cases, or 9·7 per cent., showing carcinoma, and 683, or 0·8 per cent., showing sarcoma. The incidence of malignant disease was thus shown to be much higher by the evidence of post-mortem examinations, than by that of uncontrolled clinical diagnoses. Even when the cancer was superficial, it was not infrequently overlooked by the clinician, and 4·93 per cent. of the 1297 cases of external cancer were undiagnosed during life. In another 3·24 per cent.

[1] Deutsche medizinische Wochenschrift, Feb. 15th.

the site of the disease was wrongly located, and 10·86 per cent. of the cases of superficial sarcoma were not recognised as such. Of 5908 cases of internal cancer, 17·17 per cent. had escaped diagnosis altogether, and in 15·04 per cent. the disease had been wrongly located. Thus diagnostic mistakes were made in 32·21 per cent. of the cases of internal carcinoma, and in the case of internal sarcoma, this mistake-rate was still higher, being 44·7 per cent. Of 450 cases of pulmonary and bronchial carcinoma coming to necropsy, 240 had been wrongly diagnosed. As was pointed out by Dr. Benda, who took part in the discussion, post-mortem examinations are not only of value in the compilation of truthful statistics, but also in forming a just opinion in traumatic cases, and in adjudicating on pension and insurance claims. As another speaker pointed out, necropsies discourage ill-considered diagnoses. The time when a necropsy is regarded as an unavoidable preliminary to burial may still be far distant, but when it comes it will assuredly witness a more careful and skilled physical examination of the patient than is usual at present.

THE HOSPITAL WORK OF THE SALVATION ARMY.

COMPARATIVELY little appears to be known by the general public of the medical and hospital work which the Salvation Army is doing in various parts of the world. In a recent issue of the *War Cry*, the official organ of the Salvation Army, an account is given of some of the activities carried on at home and abroad by means of the international medical service organised by this body. In Great Britain the medical work appears to have grown directly out of the maternity homes which were opened in most of the great cities for the benefit of unmarried mothers. In response to public demand these facilities were extended, and lying-in hospitals for all classes of women were subsequently founded in London and the provinces. The Mothers' Hospital at Clapton, which was opened in 1913 by Princess Louise, Duchess of Argyll, is perhaps the best known of these institutions. The value of the work carried on here may be gauged by the fact that during 1923 1129 births took place in the hospital, and 1493 under the direction of the Mothers' Hospital district visiting staff.

The medical work in *India* is represented mainly by three large hospitals—the Catherine Booth Hospital in Nagercoil, Travancore, the Emery Hospital in Gujerat, and the Thomas Emery Hospital in Moradabad, United Provinces. From the Emery Hospital a medical motor-van goes out among hundreds of neighbouring villages, taking skilled surgical relief to thousands of ignorant villagers. Two hundred cases weekly are treated by this means alone; while in many other centres are village dispensaries from which simple remedies and appliances are distributed. During 1922 51,254 patients were treated by the Salvation Army in India, and 451 major and 1989 minor surgical operations were performed. The *Dutch Indies* are well served by the Salvation Army, one outstanding piece of work being that carried on at the William Booth Eye Hospital at Semerang under the direction of the well-known Danish ophthalmic surgeon, Dr. W. A. Wille. During a recent year there were no fewer than 43,650 consultations at this institution. Another branch of work, no less valuable, is connected with the four leper settlements founded by the army in the Dutch Indies where leprosy is very rife. A maternity home has been established at Soerabaja, attached to which is a children's clinic and an institution known as a policlinic at which 47,128 patients were treated during 1922. A new hospital which will accommodate some 80 patients is now in course of erection at this centre. Apart from these institutions there are a number of medical stations in Java and elsewhere at which ailments are treated by simple remedies administered by non-medical workers.

In *China* plans are being laid for the erection of a large hospital. *Japan* boasted the only Salvation Army tuberculosis sanatorium in the world, 351 patients having been treated here during 1922. Medical work, however, received a severe set-back through the earthquake and fire on Sept. 1st of last year. The hospital in Tokio was completely destroyed, but within a few hours of its destruction a temporary hospital for expectant mothers had been established among the ruins. In *Cape Town* the William and Catherine Booth Memorial Hospital for Women and Children, the first of its kind in the Union, has proved a boon to the people. A training school for midwives and nurses has been incorporated with it, and there is a widespread demand for the services of students who have received their training here. Hospitals and maternity homes are in operation in many centres throughout the *United States*, dental clinics also being common. In *Canada* the Grace Hospital for Mothers, at Winnipeg, has over 200 beds which are always full. More than 1400 births took place there during 1922. Edmonton and Halifax also possess well-equipped hospitals. In *Australia* representative institutions are the Bethesda Hospital, Melbourne, and the McBride Maternity Hospital, Adelaide.

While there may be conflicting views as to the wisdom of using medicine as an approach to evangelisation, there can be no doubt that in the world-wide activities briefly outlined here the Salvation Army is rendering social service of a high order. Pioneer work such as this, carried on in places in which there is no question of overlapping must command admiration and sympathy.

ELECTROCUTION OF MOSQUITO LARVÆ.

Dr. José F. Montellano, of the Argentine National Department of Hygiene, has had, says the *Semana Médica* (Buenos Aires), the happy thought of employing electric currents in the destruction of the larvæ and nymphæ of anopheles and other transmitting species in infected zones. Dr. Montellano has demonstrated by his experiments that the larvæ possess but a feeble resisting power to electric currents whether continuous or alternating. An official trial took place recently in Dr. Wernicke's department of the Bacteriological Institute, in the presence of the electrical engineer (Señor Luis J. Sidler) to the Anglo-Argentine Electric Company. Señor Sidler was impressed by the results obtained and promised, on behalf of the company, the necessary technical assistance for experimentation in the open. It is hoped that the new method will prove efficacious in the campaign against paludism. Dr. Araoz Alfaro, President of the National Department of Hygiene, has the matter under consideration with a view to a grant of the necessary funds for a trial of the method in the neighbourhood of Buenos Aires, and should the results be satisfactory, for the organisation of a large-scale campaign in the paludic zone in the centre and north of the Republic.

THEORIES OF PLACENTAL CIRCULATION.

THE subject of the placental circulation, with some aspects of which Prof. J. E. Frazer dealt in the Harveian Lecture before the Harveian Society on March 20th, forms an interesting chapter in the history of anatomical medicine. From the time of Galen it was held that the umbilical vessels of the fœtus were directly continuous with corresponding vessels in the mother, artery with artery and vein with vein. An almost necessary corollary of this belief—partly resulting from it, and partly, no doubt, leading to it—was the idea that the fœtal heart did not act. It is a curious thing that such a false opinion was held throughout the time when Aristotle, who had described the beating heart of the chick in the egg, was held in such high esteem, but it may be explained, perhaps, by this very fact, inasmuch as the chicken being a creature which, in the nature of things, cannot link up with the maternal vessels, is therefore not in the same category as man and his nearer allies. Whatever may be the reason, the theory itself was, as Prof. Frazer showed, of great importance in affording ground for the Galenical explanation of the fœtal

circulatory structures. This explanation was upset, of course, by the Harveian teaching, and Harvey expressly denied the anastomosis between maternal and fœtal vessels. But he was not by any means the first to do this. Arantius probably holds pride of place in this respect, for, in his excellent account of the anatomy of the placenta, he describes the two circulations as separate, and denies any anastomosis at all between them. He was followed by many others, but his opinions were not upheld by Fabricius, Maitrejan, and Perpessac. Heister also seems to have been a disciple of the old school in this respect, and it is curious to find even Cheselden, as late as 1795, affirming his belief in the maternal blood supplying the fœtus. We note with satisfaction that, speaking generally, the leading men in this country were at one in following Hunter, whose own observations caused him to support Harvey.

A NEW ALCOHOL METHOD FOR PREPARING INSULIN.

IN a recent paper[1] by Dr. H. W. Dudley and Mr. W. W. Starling are recorded experiments on variations of the Collip process for the preparation of insulin. As pointed out by the authors, Collip's method consisted in the extraction of pancreas with plain alcohol; Doisy, Somogyi, and Shaffer improved the yield by the addition of acid to the extracting alcohol, whilst the present authors modified the method by using alkaline alcohol. They were led to this by the observation that insulin is readily adsorbed to a substance in a neutral or slightly acid medium, but not to anything like the same extent in an alkaline medium. They hoped that an alkaline solution would wash out the insulin more thoroughly. In spite of the fact that an alkaline solution favours tryptic action, it was found that their hopes were realised, and that a considerable improvement in the yield resulted. From a series of 43 experiments the optimum concentration of bicarbonate in the alcohol was found to be 85 g. per kilo of pancreas. The average yield of the whole series was 257 rabbit units, whilst that of the last eight, when the conditions had been standardised, was 412 per kilo. In one experiment 508 units were obtained. These yields are very much above those obtained by the plain or acid alcohol process. The paper represents a very large amount of valuable work. It was evidently in the press before the publication by Dr. E. C. Dodds and Mr. F. Dickens of the acetone-picrate process whereby methods of any kind involving the use of alcohol are likely to be superseded, and even higher yields obtained than those here recorded. The paper includes an important modification of Dr. Dudley's method of purification of insulin which will, in any case, be of substantial value.

THE HEALTH OF THE INDIAN CHILD.

THAT a systematic effort is being made to study and combat disease among children in India is shown by the special children's number of the *Deccan Medical Journal* (vol. ii., No. 1, January, 1924), edited by Mr. Hyderali Khan, F.R.C.S. Edin., who a few years ago was resident medical officer of a London children's hospital. This volume contains a number of articles, written by members of the Hyderabad Medical Association, describing the symptoms and treatment of the more prevalent children's ailments. These are not, as might perhaps be expected, ailments peculiar to tropical climates; they are the same ailments as occupy the attention of a London children's hospital, although their relative frequency presents striking differences. Rickets is mentioned only to emphasise its rarity, while infantile diarrhœa and tuberculous peritonitis, the two diseases in which we have noticed the most striking diminution in England during the last decade, appear to be extremely prevalent and even to be increasing. Dr. A. L. Sayeed, in his article on infantile diarrhœa, states that this ailment is commonly secondary to broncho-pneumonia, which would appear to be a reversal of the usual sequence in this country; he attributes the infection to swallowed sputum. Perhaps the most significant statements concerning the spread of children's diseases are found in the article on surgical diseases, by Mr. R. N. Coorlawala, F.R.C.S. Eng., superintendent of the Afzulgunj Hospital, relative to the serious increase in the incidence of surgical tuberculosis in the last 14 years. Of a total of 13,780 children treated in hospital during one year, over 8000 required surgical treatment, and the majority of these were tuberculous. The writer states that the increase has taken place among all classes of the community, and attributes it to such causes as the introduction of tuberculous cattle and to the large amount of dust due to vehicular traffic; he believes that over 50 per cent. of the abdominal cases are of the bovine type of infection, but gives no figures for the gland and joint lesions which formed the majority of his cases. He has, on the other hand, observed abdominal tuberculosis, even of the ascitic type, in breast-fed infants. Therapeutics receive their share of attention in this volume, and the description by Dr. Namasiwayam of an effective specific for pertussis —*Pongamia glabra*—which grows wild in the Indian forests, may well excite the envy of English physicians. The seeker after novelty will find it in the review of a recent work on infantile cirrhosis of the liver, a disease now becoming prevalent, which is "confined usually to the first male child of rich Hindus." The human side of the treatment of the child has not escaped the notice of the writers, and their efforts to combat the prejudice and superstition of mothers and "ayahs" are described with shrewdness and humour. The volume should be of real value to Indian practitioners.

THE INFLUENCE OF THE FACTORY SURGEON IN INDUSTRIAL WELFARE.

WE have recently indicated in a series of special articles the probable trend of future development in factory hygiene and some of the more pressing requirements of the moment. In a letter which appeared in our issue of March 1st Prof. E. L. Collis argued that, although industry needs a medical service, the post of certifying factory surgeon has existed for 80 years, but has failed to develop with the development of knowledge. It looks as though a new opportunity is now to be afforded to the surgeon. On March 22nd it was announced that the Home Secretary had appointed a committee to inquire into the working of the provisions of the Factory and Workshop Acts for the medical examination of young persons as to their fitness for employment in factories, and to consider the following points:—

(*a*) Whether the existing requirement of a certificate of fitness limited to a particular factory should be modified; whether any other changes should be made in the examination and certificate; and what arrangements should be adopted for the future.

(*b*) What measures should be taken for linking up the examination of young persons under the Factory and Workshop Acts with their examination under the school medical inspection service, and, if considered desirable, with other public health services of the country.

(*c*) What arrangements could best be made for providing medical supervision of young persons (where such supervision is considered necessary by the department) during employment in factories or processes where the conditions of work are unfavourable to health or physique.

The insufficiency of the services at present rendered is acknowledged by the certifying surgeons themselves, and their Association, in a report which is abstracted on p. 668, calls for extended activities. The Association holds that obligation lies upon the Government to establish "a sufficient and properly organised factory medical service," and it has in contemplation a definite scheme of procedure designed ultimately to promote this end. The most important points raised are the mechanism whereby the extended medical supervision and the

[1] Improvements in the Preparation of Insulin: Alkaline Extraction of the Pancreas. By H. W. Dudley and W. W. Starling. Biochemical Journal, 1924, xviii., 147.

raised standards of examination for young people, admittedly desirable, are meanwhile to be provided for. The advantage both to employers and the certifying surgeons to be gained by an extension of the duties of the latter is undoubted, and association of these surgeons with voluntary efforts such as welfare schemes should certainly be encouraged. In order to give some guidance to employers and surgeons on the remuneration that may fairly be demanded for additional work, a scale corresponding to that paid by infant welfare centres (a guinea per hour's work) is suggested as a minimum, and the recommendation is made that charges should be always per week, month, or year, never per visit paid. It is not likely that in the present state of national finance a comprehensive scheme of industrial medicine will be introduced by any Government. The suggestions made by the Association are likely to be useful in the interim, and indeed might well form the basis on which an Industrial Medical Service could be founded. Of especial value would be the closer association of doctors with the welfare workers, and the advice given to the latter on medical matters connected with their duties might with advantage include some talks on psychology. The factory hand who, when asked what troublesome factor in his conditions of work he would most like removed, replied "the welfare worker," voiced the legitimate resentment of many of his kind at tactless interference. With the help of the factory surgeon, the efforts on the part of the welfare worker to increase the comfort as well as the efficiency of the employee might be guided into directions which would be appreciated not only in increased output, but in greater content.

THE COMPOSITION OF BAYER "205."

SINCE its introduction Bayer "205" has always been surrounded by an air of mystery amounting almost to romance. Its powers as a trypanocide were at first said to be miraculous, whilst its toxicity was, according to all accounts, incredibly small. Its composition and formula were rigidly guarded, but the authorities of the Farbenfabrik Bayer stated that the substance contained neither arsenic nor antimony. The material was supplied only on the distinct understanding that it was for clinical use, and the person to whom it was entrusted had to give his word that no attempt would be made to determine its constitution. The clinical value of "205" cannot be doubted, since many eminent authorities, including P. H. Manson-Bahr[1] and F. K. Kleine,[2] have published series of cases treated with the remedy. A full review and bibliography of the clinical side of Bayer "205" is given in a recent article in the *Annales de l'Institut Pasteur*.[3] It would appear that the much vaunted low toxicity is apparent rather than real. For instance, in practically all of the recorded cases there has been albuminuria, which is quite a rare symptom following salvarsan treatment. In many cases 1 g. of Bayer "205" is followed by albuminuria, whereas 0·9 g. of salvarsan (N.A.B.) can be given at weekly intervals without any such sign. The ratio of the curative to the lethal dose may be very small, but the ratio to the dose causing toxic symptoms appears to be fairly high. The medical, and at the same time the national, value of "205" can hardly be over-rated. German workers have gone so far as to suggest that in "205" lies the key to Africa. It is thus not remarkable that for French and English authorities to obtain this substance was a very difficult matter, and it became obvious that independent research into the constitution, if successful, would be of the greatest possible value. Fourneau, Tréfouel, and Valleé started work with this object in view, and in the article referred to have put forward the formula of a substance which they state to be identical with the German Bayer "205" They were hampered at the outset by the difficulty of obtaining even a small quantity of the German substance. They were able, however, to overcome the rigid conditions laid down by the Bayer Company, and by "une voie très detournée," they obtained a few centigrammes. Indications of the lines upon which to work were obtained by studying a series of patents taken out by the Bayer Company on complex urea-like substances, obtained by coupling the amides of amino naphthalene sulphonic acids. Starting with these compounds and armed with a knowledge of the work done on salvarsan, these investigators set out on what appeared to be an almost hopeless task. Chemically it is possible to have an infinite number of compounds, and, at the same time, it is all but impossible to be sure of the exact manner in which the acids are coupled in any given substance. The investigators must have been imbued with wonderful hope and keenness. As they say, "Bien des fois même, découragés, nous avons eu le désir d'interrompre la poursuite d'un but qui semblait fuir devant nous." Their courage and patience seem to have been rewarded, since in their compound "309" they appear to have produced a substance identical with Bayer "205" They reproduce the formula and state that its chemo-therapeutic ratio—i.e., ratio of curative to toxic dose—is equal to that of the original German compound. Owing to the small quantity of "205" at the authors' disposal, it was impossible to prove beyond doubt that the two compounds were the same, but in all the reactions that they were able to try both substances behaved in an identical manner. The therapeutic tests were carried out on mice, and the final clinical test has yet to be performed. The authors are making trials of "309" in Africa, and it is hoped that good results will be obtained. If these are satisfactory, as one is justified in hoping, the discovery of "309" will form a landmark in chemo-therapeutics; but whatever the outcome of the clinical tests may be, the zeal and patience of the authors deserve the utmost commendation.

[1] THE LANCET, 1922, ii., 1265. [2] Ibid., 1924, i., 384.
[3] Recherches de Chémiotherapie dans la Série du 205 Bayer. Par E. Fourneau, Mme. Jacques Tréfouel et Jean Valeé. Annales de l'Institut Pasteur, Fév., 1924, No. 2, p. 81.

A NEW TREATMENT FOR HYPEREMESIS GRAVIDARUM.

AMONG the various morbid manifestations which may happen to a pregnant woman that of vomiting, which may become uncontrollable and constitute a danger to life, is undoubtedly the most important, and its treatment has for a long time been a problem among obstetricians. It is unnecessary here to enumerate the various therapeutic and operative measures which have been employed to combat this disease, but we may call attention to a new method which Dr. Pietro Castagna [1] has recently put forward. He claims to have obtained excellent results from the intravenous injection of a concentrated solution, 35 per cent., of chloride of calcium given in doses of 2 c.cm., a cure having resulted after the third or second or even after the first injection. His technique in order to avoid injury to the perivascular tissue is as follows. Before inserting the needle into the vein in the elbow, care is taken by aspiration that it does not contain any trace of the fluid, and the injection having been made a little blood is aspirated several times and re-injected into the vein so that the walls of the needle are well washed out, as to ensure that after it is withdrawn from the vein not the least trace of the caustic fluid is left in its track. By this method any sloughing action upon the paravascular tissues can be avoided, the slight erythema produced being easily remedied by wet applications. Details of five cases are given, four of which were primiparæ and in whom the vomiting was of an uncontrollable character. Treatment by morphine, adrenalin, orexin, oxalate of cerium had failed to relieve the violence of the vomiting, so that in one case rectal feeding had to be resorted to. All the cases responded promptly to the injections of chloride of calcium and the pregnancies went on to full term. These reports seem encouraging enough to

[1] Il Policlinico, Practical Section, xxxi., Feb. 25th, 1924.

justify a further trial of this method of treatment before having recourse to artificial interruption of pregnancy in the more severe cases.

PLANTS AND MEN.

ALTHOUGH Sir Frederick Keeble made no direct mention of medicine in his delightful address last week at the Royal Institution on the Plant Commonwealth and Its Government, yet there was much in what he said which appealed particularly to the trained medical mind. The lecture was largely concerned with the transmission of messages in plants. Sir Frederick Keeble depicted the vegetable organism as being constantly assailed by impulses to which it reacts. He showed how the plant cell is more constantly subjected to stimulus than are the cells of our own body and how mistakenly we employ the term to lead a "vegetable existence." Moreover, the sensitiveness of the plant is so acute that it can react to the stimulus of a weight so minute that it would be imperceptible to the most sensitive human skin. The transmission of impulses is carried out in the lecturer's opinion by hormones. The plant commonwealth is Victorian—it has but one means of transmission, the old post office—as opposed to the neo-Georgian animal mechanism, with its telephones and wireless, its nerves and arteries, veins and lymphatics. Experiments in which the growing tip of a leaf or of a root is removed and then stuck on again with a layer of gelatine through which hormones can pass were related to prove the route by which plants transmit messages in their commonwealth. The activity of plant cells in response to trauma, and the damage done to the wounded surface by over-washing were illustrated by diagrams, and were of extraordinary interest to the medical man when compared with the latest teaching of aseptic and antiseptic surgery. There can be no doubt that advances in human physiology and therapeutics might well follow on experiments devised on the lines described by Sir Frederick Keeble.

THE L.C.C. SCHOOL MEDICAL STAFF.

LAST week the London County Council came to a decision which will result in a reorganisation of its medical department. Following the example of the Ministry of Health, a new grade of officer has been created, designated "senior medical officer," with stipend appropriate to the position. By effecting certain economies, the cost of the department under the new scheme will be less than formerly, with the result that it has been possible to increase the salaries of the assistant medical officers. Perhaps the most interesting part of the scheme is the declaration that in the future greater use will be made of part-time officers than has heretofore been the case. Diverse views are still held as to the advisability of the public medical services being composed entirely of whole-time officers or largely of part-time officers, and it is noteworthy that the London County Council should after considerable experience of either course resolve that "as large a proportion as possible, compatible with efficiency, of the subordinate medical staff should be engaged on a part-time basis." Apart from the senior officers there are at present 30 full-time permanent assistant medical officers in the department, and these posts will be reduced to 23 as and when opportunity arises. Eight assistant medical officers, who are engaged on a yearly basis, are to be replaced by part-time officers. This is the extent of the contemplated change in the immediate future.

NOBLESSE OBLIGE.

WE understand that Lord Banbury has in the House of Lords, as previously on two occasions in the House of Commons, stated that he had the authority of THE LANCET for an assertion that dogs were not necessary for experiment. Such a statement is untrue, and Lord Banbury has already been informed that it is misleading.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

LXIV.

THE TREATMENT OF CERVICAL ADENITIS.

A CONSIDERABLE amount of discussion has taken place in recent years concerning the nature of enlarged glands in the neck. Formerly, it was the custom to regard chronic cervical adenitis as practically synonymous with tuberculous adenitis, but there was no real evidence for this view. The assumption that the persistence of a chronic enlargement of a gland is due to the tubercle bacillus is valueless. Investigation of the glands, after removal, in cases clinically identical often fails to show any tuberculous lesion, whilst bacteriological examination of the glands often only shows the presence of a streptothrix, streptococci, or staphylococci, and these, in many cases, apparently of a low degree of virulence. Consequently, it is now increasingly realised that a large number of cases of chronic adenitis are, at any rate in their earlier stages, of a simple nature and dependent on some chronic irritative lesion. The subject of local irritation in respect to the development of tuberculous glands is an exceedingly important one, and it has, I think, been proved satisfactorily that in a large majority of cases the incidence of a tuberculous process in a glandular group has been preceded by injurious irritation in some part of the region drained by the lymphatics afferent to the group.

Causes other than Tuberculosis.

In the region of the neck there are so many sources of possible irritation that the most thorough investigation must be undertaken before any drastic treatment of the actual glandular enlargement is embarked on. The scalp must be examined for impetigo, seborrhœic eczema, pediculi, and other lesions. The possibility of oral sepsis must be investigated, and carious teeth, alveolar periostitis, unhealthy tonsils, or ulcerative lesions of the fauces, tongue, and floor of mouth looked for. The ears must be examined for any evidence of discharge, whether due to infections of the external auditory meatus or to chronic suppurative otitis media, whilst adenoids must be looked for in the nasopharynx. It is not easy to say by which route the infective process more commonly enters, but it is probable that in the majority of cases in children, unhealthy tonsils and adenoids and carious teeth are responsible. It is quite remarkable, at any rate in the south of England, how the number of cases of extensive cervical adenitis has diminished since the teeth and tonsils have been properly attended to, so that it is quite unusual to see patients with large masses of glands in the neck, though this was quite a common sight 20 years ago.

That the tonsil is a portal of entry has been, I think, satisfactorily proved, and recently published investigations by Dr. S. R. Gloyne and myself [1] over a series of 300 cases of unhealthy tonsils associated with cervical adenitis showed that the infecting organisms were mainly streptococci (hæmolytic and non-hæmolytic) and pneumococci, whilst the tubercle bacillus was only found in the tonsil in 5 per cent. of the cases. If, as is probable, tuberculosis is a late and superadded infection, the most important factor in the treatment of chronic glandular enlargement, with a view to the avoidance of extensive operative interference, is the complete elimination of all primary foci of infection. If this is effected it will be found that in a large number of cases the glands subside and eventually disappear. Complete resolution should not, however, be expected always to take place immediately, and occasionally a year or more may elapse before the glands finally disappear. In slow cases especially, though it applies to all, good fresh air, preferably in the country or at the seaside (the latter usually better for adults)

[1] THE LANCET, 1923, i., 1202.

combined with the maximum of sunlight together with the use of syrup of iodide of iron, are most useful adjuncts. It is doubtful whether any external applications such as iodine influence the course of resolution perceptibly. Although in a large number of cases the glands tend to disappear under the general treatment outlined above, there remains a residue of cases in which the enlargement of the glands persists.

Conservative Methods.

This group may be dealt with either conservatively or radically. The exponents of conservative methods pin their faith to a carefully thought-out régime of sunlight and country or seaside air, metabolism being raised by graduated exposure to the open air and by sea bathing. Should a gland break down it may be dealt with by aspiration with a sterile needle and the application of pressure or the injection of bismuth and iodoform emulsion. Merely emptying the gland will, in many cases, cause it to subside. If frequent aspiration is likely to be necessary the use of a seton is sometimes advocated. This method is more commonly adopted in France, but recently has had its advocates in this country. If this method is tried, a seton made of a double thread of strong silk, with the points of entrance and exit at some distance apart, is probably best and it may be left in for two to three weeks. At the end of this time suppuration has usually ceased and a cure is obtained with the formation of very small punctiform cicatrices which are hardly visible. As a rule, however, broken-down glands heal satisfactorily if opened by a small incision, their contents evacuated, and the abscess very gently scraped. It should be drained, not packed, by a small ribbon of bismuth gauze.

X rays have been found of great value in the healing of sinuses, often one or two applications being sufficient. X rays are also particularly useful in enlarged glands where a good deal of periadenitis is present. Injections of tuberculin in properly graduated doses, at suitable intervals, have in some instances proved a useful help. There is no doubt that under such treatment as the above large numbers of cases of cervical adenitis have become perfectly well. Many of these cases had been proved to be of a tuberculous nature, and the fact that they were cured tends to show how remarkable is the natural reparative power of the body against tuberculous infection.

Radical Methods.

The advocates of the more radical method of treatment do not deny that by many methods of treatment improvement, and possibly cure, may be brought about; but they are inclined to doubt whether such cures are permanent or the methods applicable to the more extensive cases the tuberculous nature of which has been definitely proved. They also maintain that the time of recovery would be shortened considerably by surgical treatment. In such cases more active surgical intervention is suggested as the alternative. Naturally, the extent of the operation must depend on the requirements of each particular case, but it should be the aim of the surgeon to get rid of the whole mass of infected glands as thoroughly and completely as possible. I have already mentioned that it is quite unusual to see many cases of very extensive cervical adenitis in the south of England, but they do undoubtedly occur in other parts of the country, and this fact must demand special and perhaps more radical methods of treatment. Incidentally, a clue may be afforded to the cause of the numerous cases of extensive disease occurring in a particular locality and the possibility of some form of preventive treatment being instituted. Some years ago an elaborate investigation by Dr. A. P. Mitchell [2] showed that cow's milk containing bovine tubercle bacilli was clearly the cause of 90 per cent. of the cases of tuberculous cervical glands in infants and children residing in Edinburgh and district. If such is still the case it is obvious that this source of infection could be dried up at once if the local authorities possessed and used proper powers for the control of the milk-supply, or if all milk was sterilised before use.

It must, however, not be assumed that this explanation holds universally, and the extent to which the milk of tuberculous cows is actually responsible for the infection of mankind with tuberculosis is very variable in various places. Statistics on similar lines to those just mentioned give the surprisingly low figure of 1 per cent. in Berlin, whilst in Italy the infection of human beings with tubercle bacilli of the bovine type is almost equally uncommon.

Advanced Cases of Proved Tuberculous Nature.

Be this as it may, the necessity of dealing with advanced cases of cervical adenitis of a tuberculous nature is still present. It is maintained by the advocates of helio-alpine treatment that progressive insolation in high alpine surroundings does produce remarkable cures even in advanced cases, and that large masses of indurated and adherent glands may be completely absorbed in six months, or where sinuses are present the whole infected gland may be extruded as a sequestrum, and the sinus rapidly heal with the formation of a supple scar. In this country, however, extensive surgical removal of the whole infected area provides the best chance of a satisfactory result. In the neck such procedure may involve the complete dissection of the infected glands in the anterior triangle, but may also demand the sacrifice of the sternomastoid and the elimination of all the posterior group of glands lying on the splenius and levator anguli scapulæ muscles. Excellent results have been obtained from such drastic procedures as these, and the necessity for them should not either be overlooked or dismissed.

Conclusion.

In conclusion one may say that (1) all primary foci of infection (tonsils, teeth, &c.) should be eliminated and adequate time allowed for the subsidence of the secondary adenitis; (2) if this fails to occur, conservative surgical methods combined with general and special therapeutic measures should be tried; (3) in the more extensive cases a thorough and complete removal of the whole of the infected glands should be effected.

WALTER G. HOWARTH, M.B. Camb., F.R.C.S. Eng.,
Surgeon to the Throat Department, St. Thomas's Hospital.

[2] Brit. Med. Jour., Jan. 17th, 1914.

The Services.

ROYAL ARMY MEDICAL CORPS.

Capt. J. A. Charles, late R.A.M.C., Mila., to be Capt.

MILITIA.

Capt. D. M. Lyon to be Maj.

TERRITORIAL FORCE.

Maj. A. W. Howlett, from the half-pay list, is restd. to the estabt.

Maj. A. R. Moodie to be Lt.-Col. and to comd. 152nd (High.) Field Amb.

D. R. Owen to be Lt.

Sanitary Companies: Maj. (Bt. Lt.-Col.) R. E. Lauder is ret. on completion of tenure of comd. of the 7th Southern San. Co., and retains his rank.

D. W. E. Burridge (late Lt., 5th Bn., W. York R.) to be Lt.

TERRITORIAL ARMY RESERVE.

Lt.-Col. H. F. W. Boeddicker, from active list, to be Lt.-Col.

Capt. G. F. Hardy, from active list, to be Capt.

ROYAL AIR FORCE.

Flight Lt. (Hon. Squadron Leader) A. G. Lovett-Campbell relinquishes his temporary commission on account of ill-health.

INDIAN MEDICAL SERVICE.

The King has approved the admission of the following: To be Lieutenants: J. E. Gray, J. S. Riddle, G. P. F. Bowers, R. McRobert, G. Dockery, J. C. Drummond, F. H. Whyte.

The King has approved the relinquishment of his temporary commission by Capt. Nawab-ud-din, who is permitted to retain the rank of Capt., and the retirement of Lt.-Col. S. A. Harriss.

Special Articles.

DRUG INCOMPATIBILITY.

A NOTE ON GENERAL PRINCIPLES FOR THE GUIDANCE OF PRACTITIONERS.

BY PERCY MAY, D.SC. LOND., F.I.C.

FROM time to time, most practitioners and physicians encounter cases of incompatibility of drugs with one another, or with the solvent or with the body fluids. In many cases these cannot be easily foreseen, and it is obvious that a detailed list of all recorded cases would be excessively lengthy—and, moreover, incomplete almost as soon as it were written. Certain general principles can, however, be pointed out as a help in avoiding pitfalls of this kind.

It is not proposed to deal here with cases of therapeutic incompatibility, but to confine our attention to chemical and physical incompatibilities. But in this connexion it should be noticed that an apparent chemical or physical incompatibility need not necessarily prevent the useful therapeutic action of the drugs. For example, the products formed by the double decomposition of two substances may be therapeutically equivalent to the original substances, and in this case the incompatibility is more apparent than real. Even if one of the products of double decomposition is insoluble it may be quite effective therapeutically, though in this case its formation is undesirable on account of the difficulty of ensuring accurate and uniform dosage in a mixture containing sediment. Instances of insoluble but therapeutically very active substances are numerous; it may be sufficient to mention calomel, which is one of the most insoluble salts known, and the purgative derivatives of anthraquinone, the therapeutic efficiency of which is roughly proportional to their insolubility. On the other hand, there are cases where the formation of insoluble substances may be very dangerous where these are of a toxic nature. In some cases this happens without the actual appearance of a sediment if another solvent be present in which the insoluble substance can dissolve and form a separate layer. A case of this type is quoted by Gilmour.[1]

Liq. morphinæ	1 oz.
Liq. atropinæ sulph.	20 minims.
Spt. ammon. aromat.	4 dr.
Spt. chlorof.	6 dr.
Aqua ad	6 oz.

In this case the salts cause separation of some of the chloroform as a bottom layer, and the spt. ammon. aromat. sets free the alkaloids from their salts. As the free alkaloids are far more soluble in chloroform than in water, they are extracted by the former, and are therefore concentrated in the bottom chloroform layer. Unless the bottle is well shaken before each dose, there is a possibility of the last dose containing a fatal quantity of alkaloids.

Incompatibilities of Drugs.

Taking first the most important group of incompatibilities, those of drugs with one another, we find first the simple cases which should be obvious to all possessing a rudimentary chemical knowledge. These include acids with alkalis, calcium salts with alkaline carbonates and phosphates, silver salts with chlorides, &c. Other similar cases, where two soluble salts react to give a precipitate, are well known, and need not be detailed. Their occurrence is readily manifested, and the cause can quickly be detected. As mentioned before, the formation of a precipitate does not necessarily affect the therapeutic efficiency of the mixture, but is usually undesirable on account of the difficulty of accurate dosage. Similarly, the incompatibility of an acid and an alkali need not in all cases be of significance, as long as the salts formed have the desired therapeutic effect, although in this case it would be better to prescribe the salt in the first instance.

Other cases of slightly less obvious incompatibility are those in which we have to deal with substances which, although not usually regarded as acids or alkalis, nevertheless react as such. Amongst compounds of acid reaction should be included salts of strong acids with weak bases, including most of the soluble inorganic salts of iron and the heavy metals, and a large number of the soluble salts of the alkaloids with strong mineral acids—i.e., hydrochlorides, sulphates, and nitrates. A substance of which the strongly acid nature is often unrecognised is saccharin. It is one of the strongest organic acids, and this fact should be recognised in prescribing it. In cases where its acidity may be undesirable, its stable and soluble sodium or ammonium salt (soluble saccharin) may advantageously be used instead. There are also some substances which are neutral when quite pure, but which readily give acid decomposition products when in solution or in presence of moisture. Spirits of nitrous ether and liq. ethyl nitritis are good examples of this type, and for this reason it may be advisable to neutralise the spirit with potassium bicarbonate before using it in mixtures where the presence of acid may be a disturbing factor.

Amongst the substances which it is inadvisable to prescribe with compounds of acid reaction are ammonium acetate, tartar emetic, all nitrites, the soluble salts of salicylic and benzoic acids, &c. The alkaline nature of the sodium and potassium salts of weak acids, such as the carbonates, is well recognised, but it should be noticed that borax is also strongly alkaline, and on this account is incompatible with many substances. Thus, for example, solutions of borax are sufficiently alkaline to absorb carbon dioxide with formation of sodium bicarbonate and boric acid, and when warm their alkalinity is even great enough to decompose chloral with formation of chloroform and sodium formate. Solutions of borax also precipitate alkaloids from solutions of their salts. Borax precipitates insoluble borates of nearly all the metals from solutions of their salts, though these precipitates are sometimes soluble in excess of borax or in solutions of ammonium salts. The presence of glycerine often prevents this precipitation. Borax and hydrogen peroxide, though not actually incompatible, should be prescribed together with caution, as hydrogen peroxide is unstable in alkaline solution, and the pressure of oxygen evolved from it may burst the container. On the other hand, the alkalinity of borax accounts for many of its valuable properties, such as its power of dissolving casein, fibrin, uric acid, and many resins, and of forming stable emulsions with many oils, often superior to those obtained with lime. One striking peculiarity of borax is the fact that it develops an acid reaction in the presence of glycerine, and is then incompatible with carbonates, from which it liberates carbon dioxide. Glucose, honey, and other polyhydroxy-alcohols share this peculiarity with glycerine. Another incompatibility of borax is that it forms a moist mass when triturated with alum, through liberation of the water of crystallisation of the latter. Sodium or potassium compounds of weak acids are sometimes strongly alkaline, and veronal-sodium, for example, is sufficiently alkaline to cause evolution of ammonia when prescribed with ammonium bromide. Potassium bromide should, of course, be used instead in this case. Soaps, also, have an alkaline reaction, and this should be remembered in connexion with soap emulsions and liniments. Many substances which are neutral when pure may be alkaline in the ordinary specimens met with in practice. For example, ordinary commercial sodium cacodylate is usually alkaline though it is neutral when quite pure.

[1] Pharm. Journal, 1916, xliv., 43.

Oxidising and Reducing Agents.

Another type of chemical incompatibility which may be foreseen by the application of chemical knowledge is that of oxidising with reducing agents. Some cases may be fairly obvious, but others are not so readily apparent. Amongst the oxidising agents used medicinally should be mentioned free iodine and preparations thereof; hypochlorites (including bleaching powder); organic chloramines, such as chloramine-T and halazone; permanganates; ferric salts (particularly the chloride); hydrogen peroxide; nitrites in the presence of acid, and notably preparations containing ethyl nitrite and amyl nitrite; nitric acid; potassium chlorate, &c. Reducing agents are not so frequently used as oxidising agents, but many substances can act as reducing agents in presence of a strong oxidising agent. For example, phenol (carbolic acid) readily reduces permanganate of potash, as do many other organic substances, and it is therefore useless to attempt to utilise the bactericidal properties of permanganate in conjunction with those of phenol. Alcohol and many other organic compounds frequently reduce strong oxidising agents. More definite reducing agents frequently used are sulphur dioxide, sulphites, hydrosulphites, and sulphides, ferrous salts, iodides in acid solution, most free metals, and notably mercury and nearly all finely divided or colloidal metals, formalin, paraldehyde, hexamine, and many other organic compounds. It stands to reason that an oxidising agent will be incompatible with a reducing agent, and these lists will indicate various pairs of incompatibles which might be encountered in practice. But a more remarkable incompatibility sometimes met with is that of two oxidising agents together which reduce each other with liberation of free oxygen. Hydrogen peroxide and permanganate are a pair of this type, and are reduced to water and manganese dioxide with evolution of oxygen, and therefore should not be prescribed together. Chloramine-T is another antiseptic oxidising agent to which this applies, as it reduces hydrogen peroxide with evolution of oxygen. Hydrogen peroxide is also reduced by alcohol, and is reduced catalytically by many substances, amongst which organic silver compounds are noteworthy.

Some Special Cases of Chemical Incompatibility.

We must now consider a few cases of special chemical incompatibility which cannot be referred to a general type and therefore cannot be so readily foreseen. One of these, which has been previously indicated, is that of chloral hydrate which is incompatible with alkali such as spt. ammon. aromat. with formation of chloroform and sodium formate. Hexamine is noteworthy among the substances which have many incompatibilities, and caution should always be used in prescribing it with other substances. Substances which can be converted by simple chemical changes into more toxic substances should, of course, be prescribed with great care, and should usually be given by themselves, and not in conjunction with other drugs. Calomel is one of these, as it is rather easily oxidised to corrosive sublimate. Bromides and iodides are dangerous with calomel, particularly in presence of oxidising agents, and free iodine or its preparations should be most carefully avoided when calomel is being administered. Another frequently quoted case of danger from calomel is its incompatibility with antipyrine. This is said to give a very toxic mixture, and it has been suggested that corrosive sublimate is formed according to the equation[2]:—

$$6\,HgCl + 2\,C_{11}H_{12}O_2N_2 + H_2O = 2\,Hg + Hg_2O + 2\,HgCl_2 + 2\,C_{11}H_{12}O_2N_2,\,HCl.$$

But this is doubtful, and it has been suggested that the formation of corrosive sublimate from calomel under the conditions of therapeutic practice is a myth. On the other hand, there can be no doubt of the need of the greatest caution in the use of calomel with organic compounds, as many of the organic mercury derivatives are most intensely toxic and far more dangerous than corrosive sublimate, so that the formation of only a trace of them would be attended with the gravest risk. This seems the more likely explanation of the poisonous incompatibility of antipyrine and calomel, and according to Paderi[3] a compound, $HgCl–N(CH_3)(OH)–C_{10}H_9ON$, is formed, which is more toxic than corrosive sublimate.

Antipyrine is also incompatible with nitrous acid or with sweet spirits of nitre, unless the latter is previously neutralised, as free nitrous acid converts it into nitroso-antipyrine. Tannic acid or tannin is another substance of many incompatibilities. It is precipitated by ferric salts, silver salts, and many other metallic salts, by acids, and by gelatin. An example of a complex change in which more than two substances take place is furnished by galenical preparations of quinine and cinchonine which in presence of organic acids and ferric salts sometimes darken with the formation of quintoxin and cinchotoxin, both of them extremely toxic substances, especially the latter.

Another interaction of ferric salts with organic acids which is of interest is the oxidation of citric and other acids with evolution of carbon dioxide. This only takes place in daylight, and is a purely photochemical change. We have here, therefore, a physico-chemical incompatibility, and this forms a connecting link with the following section, which deals with cases of a physical rather than a chemical nature.

Physical Incompatibility.

The chief physical cause of incompatibility is the influence of one dissolved substance in lowering the solubility of another, whereby the latter is thrown out of solution. When one of the substances is of a saline nature, this phenomenon is often known as "salting out." This happens most readily when two substances are present having a common ion, as in the well-known method of purifying sodium chloride by passing hydrogen chloride into its saturated solution. In this way codeine bromide is salted out by an excess of sodium bromide, and very many other instances of this type are to be met with. As most salts are less soluble in dilute alcohol than in water, the presence of alcohol in any form is liable to cause crystallisation of sparingly soluble salts. Potassium chlorate, for example, crystallises out very readily in the presence of alcohol. Conversely, substances like chloroform which are more soluble in pure water than in salt solutions are thrown out of solution by saline substances, and there is sometimes a risk of chloroform being thrown out as a separate layer from prescriptions made up with chloroform water.

In powder mixtures trouble may be caused by another common physical property—namely, the mutual lowering of the melting-point (m. pt.) of the components of a mixture. It is well known that an impure substance has a lower melting-point than when in a pure state, and therefore it is not very surprising to find that where two substances of moderately low m. pt. are mixed, the m. pt. of the mixture may be low enough for it to be liquid at ordinary temperatures. For example, salol (m. pt. 43° C.) gives with antipyrine (m. pt. 114° C.) a mixture of m. pt. 30° C., with menthol one melting at 28° with chloral hydrate, one melting at 17° C. with camphor (m. pt. 175°), one melting at 6° C., and with guaiacol one melting at 3° C. The first two of these may liquefy in hot weather, and the others will be liquid at all ordinary temperatures. Sometimes a combination of three substances is necessary to produce this effect to an appreciable extent, a pasty mass being formed, for example, from antipyrine, phenacetin, and acetanilide when mixed together. Many other examples of this kind can be found. Another physical phenomenon which may cause solid mixtures to become fluid or pasty is the withdrawal of water of crystallisation from one substance, by another which dissolves in the water thus abstracted. Tartaric acid in this way forms a tasty mass with Glauber's salt or with borax. Many other examples of this type may be found when a substance very soluble in water is mixed with one containing water of crystallisation.

[2] Weidenkoff: Pharm. Zeit., 1910, lv., 780.

[3] Journal of Chem. Soc., 1920, cxviii., i., 94.

Incompatibility with the Body Fluids.

Having now dealt at some length with cases of incompatibility of drugs with one another, we will glance at a few cases where some part is played by the body fluids. The most important point in this connexion is the strong acidity of the gastric contents—namely, about pH 1·77 or about N/60 HCl. The alkalinity of the small intestine is of a lower order, and in this case the hydrolytic action of the pancreatic enzymes is of perhaps greater importance than the actual alkalinity. The two in conjunction hydrolyse, for example, acetyl salicylic acid into sodium acetate and sodium salicylate, and it will then react as a mixture of these. A case of possible incompatibility with the gastric contents is afforded by antipyrine and hexamine, which, under these conditions of acidity, form an insoluble crystalline compound.

Many interesting cases have been recorded of undesirable effects being produced by one drug reacting through the body fluids with another drug taken previously or by a drug taken internally reacting with another taken externally. For example, mercury oxycyanide is a non-irritant and valuable medium for bladder and urethra irrigation, but in patients under the influence of iodides it causes intense cystitis through formation of irritant mercuric iodide. A case has been observed[4] of severe burning of the skin on the application of hydrogen peroxide lotion to a patient undergoing internal treatment with potassium iodide through the liberation of free iodine. In the same way colourless tincture of iodine taken internally has caused great irritation of the skin on application of a mercurial ointment through the formation of irritant mercuric iodide. On account of the irritant nature of mercuric iodide, dressings of corrosive sublimate should not be used on wounds previously treated with tincture of iodine. If this should happen, the mercuric iodide is best removed by washing with potassium iodide solution. A similar incompatibility is recorded in the use of external applications of mercury and the internal use of sulphur compounds, brown or black stains of mercuric sulphide having been produced on the skin.

Incompatibility with a Solvent.

With regard to incompatibility with a solvent, the tendency of alcohol and other organic solvents to precipitate salts from aqueous solutions has already been indicated. Of course, all prescriptions should be made up with distilled water, but when the dilution of a mixture or the solution of a tablet or powder is left to the patient, tap water is generally used. In a few districts this is nearly pure, but most tap waters are hard, and so may often give untoward effects on account of the calcium and magnesium salts and sulphates which they contain. Most of these effects will be of a nature to be expected from such substances, and will include some slight precipitation of carbonates, phosphates, &c. The following is an interesting case of the effect of hard water recently noticed by us. Tablets of hexamine additive compounds, such as cystazol, readily disintegrate in soft or distilled water, but in hard water they only do so very slowly and with difficulty. By an apparent paradox, they disintegrate far more rapidly if allowed to soak in a small quantity of water to which the remainder can be subsequently added than if they are initially treated with the full quantity of water. The explanation is that in a small quantity of hard water there is not sufficient dissolved matter seriously to interfere with the disintegration of the tablet.

It is hoped that the foregoing review of the causes of incompatibility will be of some use in coördinating and classifying the large number of cases which are constantly being brought to notice.

[4] THE LANCET, 1912, i., 597.

THE Wellcome Historical Medical Museum will be closed from April 1st to the 30th inclusive for redecoration and cleaning.

REPORT OF THE ASSOCIATION OF CERTIFYING FACTORY SURGEONS

(1922–23).[1]

THIS report, which deals with a period of two years, opens with the remark that the Factory Acts are much in need of amendment and overhauling, and welcomes the announcement in the King's Speech of a consolidating Bill.

Reference is made to the considerable number of papers on industrial medical subjects read at the annual meeting of the British Medical Association in Glasgow (1922), and the holding of a conference of associations and bodies so interested, at the Royal Sanitary Institute, London, in June, 1923. This gathering was arranged by the League of Nations Union with the object of creating in the minds of those particularly concerned a more perfect understanding of the functions and activities of the International Labour Organisation, and a knowledge of how this body as a coördinating centre can materially assist external efforts by providing useful advice and information. Government factory and medical research departments, workers' unions, employers, welfare organisations, and medical associations made excellent response to an invitation to send representatives.

Work of the International Labour Organisation.

A valuable feature of the conference was a preliminary address by Mr. H. A. Grimshaw, one of the principals of the Diplomatic Section of the Central Office at Geneva, on the status and scope of the international organisation. Mr. Grimshaw referred to the common but erroneous belief that this institution is some sort of amalgamation of trade-unions, soviets, or brotherhoods, and pointed out its real position as a well-defined unit in the League of Nations constitution established by the Treaty of Versailles. He showed how its function is to secure by international action the adjustment of conditions of labour throughout the world to the requirements of justice and humanity, and that its constitution is by membership of subscribing States at present numbering 54. He explained how at periodical conferences, to which each member State sends four delegates, representing employers (one), employed (one), and the Government (two), draft conventions are formulated, recommendations with a view to coördinated legislation are drawn up, and scientific commissions of investigation are appointed. Also how a permanent staff at Geneva collects information from all quarters, both for conference needs and for the use of subscribing States, and that much of this would be available to recognised associations who cared to apply officially. He further stated that the fine library gathered together by the organisation would be at the service of duly accredited representatives of such associations visiting Geneva.

Four main industrial health questions were discussed: Safety and protection in industry; industrial fatigue; industrial disease and injurious processes; and the health of women workers. In all these discussions particular attention was directed to the influence which can now be brought to bear by the international organisation in coördinating the work of experts in various countries and in obtaining effective and uniform action among separate industrial communities. The various bodies represented certainly owe a debt of gratitude to the League of Nations Union for taking the initiative in bringing together this unique gathering of British experts.

The Position and Prospects of the Certifying Surgeon.

In addition to rendering an exceptionally useful account of the year's working, the annual report for

[1] Manchester, 1924.

1921 ventured to make a somewhat special feature of reviewing the position and prospects of the certifying surgeon. In dealing with this subject three points were specially emphasised. The first had relation to the obligations of the Government towards the establishment of a sufficient and properly organised factory medical service, and sought to demonstrate that, however desirable statutory reform might be from a health and efficiency point of view, there would be little likelihood of any definite official action being initiated whilst national finances are in so precarious a state. The second point dealt with the powerful move which is being made to influence industrial opinion on the advantages to be gained in health and efficiency from the voluntary establishment of welfare schemes and a sufficient measure of medical supervision over workers and work places. The third point dealt with the so-called works' doctor, the advisability of certifying surgeons getting into touch with the voluntary effort movement, and the mutual advantages to be gained by employer and surgeon if arrangements are made for the latter to take up, as far as possible, any extension of medical duties at factories within his own district. The Council had good reason to believe that the publication of the definite views of the Association on the subject of improved medical supervision and on its attitude towards an extension and a higher standard of examination for young people had met with the approval of contemporary bodies and associations interested in bringing about healthier conditions in industry.

At a conference organised by the Industrial Welfare Society to consider the "value of medical supervision in industry," which was held in Manchester on June 26th, 1922, the Association was represented by six members of the Council officially as well as by other certifying surgeons. The statutory position and duties of the certifying surgeon were explained by Dr. S. A. Henry, H.M. Medical Inspector; Dr. T. Watts, Dr. H. E. Watkins, and Dr. W. F. Dearden illustrated the advantages to be gained by employers making arrangements with certifying surgeons for extended services, and the particular advisability of doing this where welfare work was already in operation. Dr. A. Glen Park showed, from his own experience, what useful work can be accomplished by appointing the district certifying factory surgeon as medical officer to any continuation school established in connexion with a factory.

The willingness shown on previous occasions by the Welfare Workers' Institute to coöperate with the Association explained the interest taken by this body in the proposed increased scope of the surgeons' executive and advisory functions. The honorary secretary availed himself of an opportunity to discuss the new policy with Miss Voicey, who was then secretary of the Institute, and was assured that it would be heartily welcomed by her fellow-members. This lady, however, very properly pointed out that if welfare supervisors were to coöperate successfully in obtaining improved medical service it would be necessary to establish a clear understanding on the all-important item of cost to the employer. The honorary secretary of the Association (Dr. W. F. Dearden) agreed therefore to bring the financial aspect of the question to the notice of the council with a view of obtaining an authoritative opinion on the minimum rate of payment which would be acceptable to certifying surgeons generally. He further agreed to contribute an article to the monthly journal *Welfare Work*, explaining the additional duties which should be taken up, and how to arrive at a standard for remuneration. The council agreed that charges could be suitably based on the minimum fee recognised by the British Medical Association as suitable for work of a similar class—viz., one guinea per hour—and that a fair amount for an annual contract, based on one hour's attendance per working week, would be £50; time taken up in travelling to and from, when allowed for in existing contracts, to be a matter for additional consideration.

Proposed Extension of Existing Duties.

The article was published in the *Welfare Work* issue of November, 1922, and was made the subject of a leading article. Further, the correspondence columns of the two following numbers contained a series of letters which favourably criticised the scheme outlined. A copy of the journal containing the article was forwarded to each member of the Association. It may be explained briefly that extension of existing duties was advocated in the direction of (1) a more detailed examination of young persons, (2) extension of the examination of young persons between 16 and 18 years of age, (3) re-examination every 12 months up to 18 years of age, (4) supervision of ambulance and first-aid equipment, (5) advising welfare supervisors on medical matters arising in connexion with their duties. The basis of an annual contract recommended was £1 per hour for an estimated 50 visits per year. If one hour be allowed for each visit the annual amount would be £50, if two hours £100, and if half an hour £25 to £30. Particulars had been received of a number of contracts entered into on the lines recommended. The remuneration had mostly been based on one guinea per hour, but in some cases the basis was higher. The Council would, however, like to have more information as to actual arrangements, whatever the basis, than is at present available. This departure from old-established routine was likely to have considerable bearing on the future prospects of the certifying surgeon, and members were asked to communicate their experiences to the honorary secretary.

Agreements.

It was emphasised that in making agreements members should let it be well understood that the old method of contracting for statutory services is not being disturbed. The seven days' obligation respecting certificates of fitness cannot be lost sight of, and if there is an *annual* contract in existence it must remain as such. The new arrangement was only to be regarded as an extension of the old one. The duties were increased and the remuneration was necessarily greater, but the agreement should still be for the year and the accounts presented quarterly. It would also be found advisable to commence any extension of duties at the beginning of a quarter.

It must be understood that the annual amount arrived at on the basis outlined, though considered to be fair remuneration in average cases, was the lowest that could be accepted; also that in assessing this amount a year had been taken to represent 50 working weeks at a maximum and not likely to be less than 48. Special circumstances, such as the value of the existing contract or the amount of the minimum visiting fee obtaining in a particular district by arrangement with the occupiers, would have a definite bearing on any new arrangement. It should also be noted that, as statutory duties are involved, the extended contract should be arranged with "the occupier," or some responsible person acting on his behalf, and the details of new duties thoroughly explained. In all cases the surgeon should quote an annual sum for periodical visits (weekly or fortnightly) of a specified duration; he should never quote per visit if he can avoid it. How the amount is arrived at can be explained, but is no part of the contract.

Improved Type of Examination.

The improved type of examination contemplated in the scheme undoubtedly involved the introduction of the medical card. The setting out of the card should be as simple as possible, and, though not overburdened with spaces little likely to be used, the provision made should allow for essential details of every case. The sample card reproduced gave a fair impression of how the requirements might be met. As medical experts mostly regarded it as necessary to have all medical particulars respecting a worker on his medical card, and therefore ready to hand, the greater part of the space on the back should be ruled off to show dates between which the worker had been absent

through illness, or through injury inflicted at the factory, and the nature of such illness or injury. A smaller space could also be allowed at the back for special notes. The number of cases that could be conveniently examined in one hour must depend very largely on the amount of care taken with each case.

MEDICAL CARD. *Young Persons.*

Name.	Department.	Date of starting.	Date of birth.
Previous employments and duration.		Eyesight. R. L.	
Previous illness or injury.		Teeth (carious).	
Present disease, defect or deformity.		†Physique.	
		†Nutrition.	
*Not suitable for Recommendation.		Height.	Weight.
Date.	Re-examinations—results and recommendations.	Height.	Weight.

Date of Exam. Signature

* Strike out "Not" if suitable.
† Signs may be used—o = normal; – = under normal; + = over normal.

Experience showed that whilst eight examinations might be made when the cases are straightforward it was really much better to take six and avoid being hurried or exceeding the time limit. Heights and weights were to be taken by the welfare worker, not by the certifying surgeon.

An essential point was uniformity, and the most certain method of securing this was for certifying surgeons in the various manufacturing areas to meet and agree upon a policy suitable to the needs of the particular locality. The Council would be glad to hear of such meetings, and the results.

First-aid Arrangements.

It was noted that the annual circular letter of the Chief Inspector dealt with those parts of the new Compensation Act affecting certifying surgeons. A prominent feature was the insistence on a certain degree of first-aid equipment in all factories, and in making this provision it is curious how closely our legislature should cling to tradition. As the early Factory Acts did not provide for any inspectors to enforce the requirements, and as notification of industrial disease and poisoning, together with regulation of dangerous trade processes became law without any provision for medical supervision, so was this very essential equipment made compulsory without any effective means for securing its sufficiency or proper application. As the earlier vital defects were remedied in course of time, and as the Home Secretary appeared to have certain powers in this particular matter, it might eventually come about that first-aid and ambulance arrangements would be placed under some degree of supervision by the certifying surgeon.

THE Chelsea Hospital for Women, in connexion with the Fund being raised at the London Mansion House, has received for its nurses' home (now building) £105 from Sir John Mullens, and £50 from the Worshipful Company of Mercers.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Death of Sir Walter Buchanan.

THE death of Sir Walter James Buchanan, M.D. Dub., K.C.I.E., occurred at his residence in Dublin on March 23rd, after a few days' illness, at the age of 62. A native of Londonderry and educated first at Foyle College in that city, Buchanan had a distinguished career as a medical student in Trinity College, Dublin, graduating M.B., B.Ch. in 1887. In the same year he won the University Travelling Prize in Medicine and passed into the Indian Medical Service. After some time passed as house surgeon in Sir Patrick Dun's Hospital, and in the National Eye and Ear Infirmary, Dublin, he went to the East. He took part in the Hazara Expedition in 1888, and in the Lushai Expedition in 1890. He served in the Manipur Field Force in 1891 and was awarded a medal and clasp. In the following year he joined the civil branch of the Service. From 1899 to his retirement in 1919 he was editor of the *Indian Medical Gazette*, and from 1902 to 1919 he was Inspector-General of Prisons in Bengal. As a member of the Indian Prisons Commission he visited the United States, China, Japan, and many other countries. Since his retirement Sir Walter Buchanan has lived in Dublin, where he has given frequent lectures on his travels. He had a retiring disposition, plain exterior, and unassuming manner, but it was obvious to all who met him that he was a man of unusual character and ability. His unexpected death will cause regret both in Ireland and in India.

The Tax on Anæsthetics in the Free State.

Last week in the Free State Senate Dr. W. O'Sullivan moved, "That, in the opinion of the Seanad, ether, chloroform, and other drugs used in the relief of the sick should be free of taxation." He said that he would appeal to the Minister of Finance to do away with that tax in his next Budget. It was inflicting a terrible hardship on rich and poor alike. The tax was proposed as a protective tariff in England. He instanced two cases where the patients had died before the drugs ordered arrived from England. Senator Jameson suggested that a small central store of these necessary articles should be established by the Government. By that means the drugs could be got at the store by the people needing them on paying the necessary cost. The resolution was passed with the addendum that arrangements should be made to obviate delay in transmission.

Central Midwives Board of the Free State.

The first meeting of the recently elected Central Midwives Board for the Free State was held last week. Sir Andrew Horne was elected chairman and Senator O. St. J. Gogarty vice-chairman. Arising out of a letter from the Joint Nursing and Midwives Council for Northern Ireland, it was decided that no further applications for the enrolment under the Act of midwives who were trained prior to 1918 would be accepted by the Board, as six years have now elapsed since the passing of the Act. Such midwives will in future be required to pass the examination of the Board.

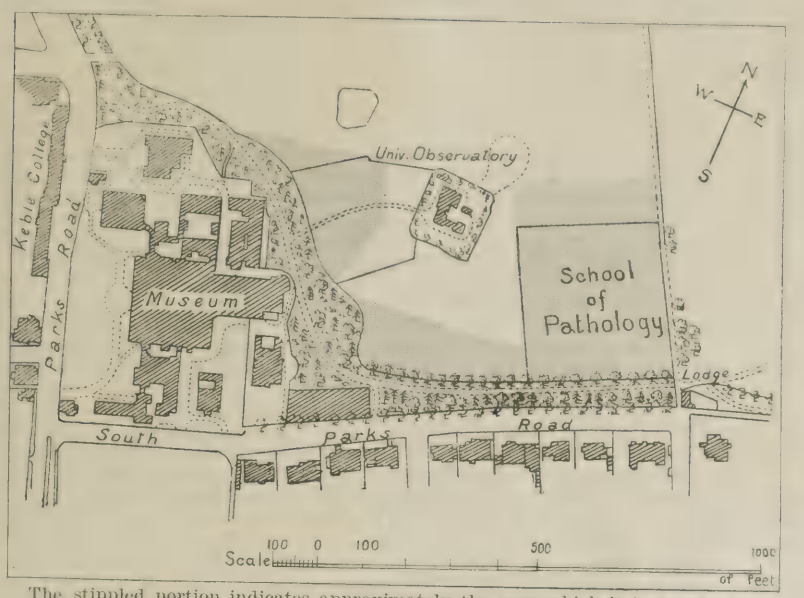
HORSHAM HOSPITAL.—This hospital, which moved into larger buildings, erected at a cost of £18,000, during the summer, is announced to be free of debt. It was noted at the annual meeting of governors held on March 19th that there was a balance on the year's working of £123 and a balance in the hands of the matron of £24. The contributory scheme had on Dec. 31st only been working for three months, but so satisfactorily has it been taken up that there are now 1750 contributors. The scheme brought in £196 in three months. The governors have been requested to consider the question of representation of the contributors on committees controlling the affairs of the hospital.

UNIVERSITY OF OXFORD:
EXTENSION OF SCIENCE DEPARTMENTS.

WE have received some particulars about the gift to Oxford University from the Rockefeller Foundation, and further details of the arrangements made by the University in connexion with it, and with the recent gift under the will of the late Sir William Dunn (pathology). A decree approved by Congregation on March 4th, and passed by Convocation on March 11th, proposed to set aside a certain area in the University Parks for the extension of science departments. A decree defining more precisely the space to be allocated to science departments was carried in Congregation on Feb. 20th, and subsequently in Convocation on March 4th. Had this decree been lost, an alternative decree was to have been brought forward at the same meeting; the opposition to the decree passed represented, for the most part, a preference for the alternative site, and not an opposition to the assignment of any site in the Parks. In the *Gazette*, in which notice of this decree first appeared, there was added a statement by the Hebdomadal Council, of which the following is a copy:—

"*Note 3.*—The Hebdomadal Council is of opinion that the settlement arrived at by the above decrees would provide for the developments of natural science during the present generation, but not for the establishment of the forestry department in the Parks or for the transference to the Parks of the present botanic garden and department."

The accompanying rough map shows the area now assigned to scientific departments, which is a little over 9 acres in extent, and is at least 2½ acres larger than the whole area at present covered by scientific buildings. By the assignment of space in the Parks the future development of the departments of natural science is assured for a long time to come, since it will now be possible to draw up a considered scheme, instead of having to fight on each occasion to secure the immediately adjoining bit of land for any new building, irrespective of its convenience in relation to the future of other departments.



The stippled portion indicates approximately the area which it is proposed to allocate in Decree 2 for extensions of the Scientific Department.

By the two magnificent gifts made recently to the University is secured not only a new department of biochemistry and a fully-equipped school of pathology with stables, paddock, &c., but also a new department of pharmacology in the quite modern pathology block—for which purpose the Dunn trustees have assigned £3000; also the whole space of the present department of biochemistry (part of the physiology building added in Prof. Gotch's time) becomes available for physiology, affording a very considerable addition.

It is suggested that the next requirements here (or among the next) are chairs and departments in hygiene and parasitology. The Regius Professorship of Medicine is only partially endowed.

BERLIN.
(FROM OUR OWN CORRESPONDENT.)

Further Developments in the Battle of the Clubs.

THE so-called strike of medical men over certain changes which had been brought about in club practice, as described in these columns (THE LANCET, Jan. 19th, p. 154), has been called off by the Leipziger Verband in the greater part of Germany. The strike has ceased on the condition that the status quo ante will be restored until further arrangements are made, which will, it is hoped, allow the maintenance of the free choice system. In Berlin, however, the battle continues, although the Berlin Medical Union, following the instructions of the Leipziger Verband, offered to work again under the former conditions. The Berlin clubs declined to accept that offer and even to be represented in the meetings called by the authorities to reconcile both parties. The clubs tried to appoint their own medical officers hoping in that way to get rid of the free choice system, but the local Insurance Office gave notice that if no agreement was reached they would appoint a commissioner to administrate the working of the clubs. The clubs appealed to the District Insurance Office, which cancelled the decision of the local Insurance Office. The district office went to the length of advertising in the Berlin and provincial daily papers, inviting medical men to apply for appointments as club medical officers. Although the district office has declared that this step was necessary, as it bears the responsibility under the present law for providing adequate medical service, this obvious partiality has caused great indignation in the profession. Medical men say that if the clubs had accepted the offer made by the Berlin Medical Union a sufficient number of doctors would have offered their services. The issue of the battle will depend entirely on the firmness of the Berlin doctors. The list of doctors in club practice includes, at present, not more than 60 names, whereas the total for Berlin should be at least 1350, at the minimum rate of one doctor per 1000 club members, according to the provision of the law. The great majority of names on the list represent medical men who are known to be of a low professional standard; and some may have been compelled by need to act against the interests of their professional brethren. These club doctors have formed a medical union of their own and invite, through the press, medical men in Berlin and elsewhere to join them. Two of their leaders have been excluded from the Berlin Medical Society for breach of medical ethics, this being in the history of that

society the first instance of cancellation of a member for such reasons. The outcome of the battle, which at present is the principal topic of conversation in Berlin medical circles, will have a far-reaching effect on the Berlin medical profession as far as it is connected with club practice. English readers may conclude from this somewhat detailed report how great the difficulties of the German profession are and how little help they are obtaining from the Government in their struggle. This is the more regrettable, as in Germany non-club practice for the majority of medical men is almost an impossibility.

Statistics of the Berlin University.

Although academical circles and representatives of the liberal professions, including medicine, have repeatedly issued public warnings as to the present handicaps of a professional career, the number of students in the Berlin university, and in other universities likewise, has not decreased to any great extent, being 12,581 this year as compared to 12,741 last winter. Of this year's figures, the men numbered 10,872 and the women 1709. The newly matriculated students included 2494 men and 428 women. It is, however, remarkable that compared with the students in other faculties those of the medical faculty and the dental students showed a rather considerable decrease. This year 1781 medical and 186 dental students were inscribed against 2088 medical and 274 dental students last winter. Apart from the Austrian students who enjoy the same rights and privileges as the German students, the number of foreign students has again increased, being 2650 against 1750 in the previous winter, although the fees for foreigners have been considerably raised. Among the foreigners the Bulgarians are the most numerous, with 191 men and 60 women. The great number of foreign women students is altogether very striking when compared with the figures for German women students.

Government Reward for Life-saving Abolished.

Until recently the Government paid a reward of 10 marks to any person who succeeded in restoring life in a case of serious injury, or of attempted suicide. A non-successful attempt was rewarded with 5 marks. In the latter case, of course, the reward was paid only if there had been reasonable hope from the outset that the injured person could be saved, as people were known to claim the reward for trying to revive persons who had been dead many hours or even corpses which had been taken from the water in a stage of decomposition. Owing to the depreciation of the currency the reward has not been claimed during the last years as the sum of 5 or 10 marks was totally worthless, and therefore by a recent Government order it has been abolished. The Minister of the Interior stated that when the currency was again stabilised the Government would have no funds to pay an adequate reward, and expressed the hope that the absence of pecuniary reward notwithstanding, nobody would refuse help where a life was in danger. A reward will continue to be given in exceptional cases, where the rescuer has been put to considerable financial expense and personal risk.

PRINCESS ALICE HOSPITAL, EASTBOURNE.—The fortieth annual report presented at the meeting of governors on March 21st foreshadowed a further enlargement in the near future, two houses in Bedfordwell-road having been purchased during the year for the sum of £6000. Beginning with 12 beds only the institution has now 80 beds, the latest addition being a new dispensary. During the year 913 patients were admitted as against 903 in 1922, and 373 major and 280 minor operations were performed. The finances are in a satisfactory condition, the deficit having been liquidated by Mr. Sydney Hudson, J.P. The amount received from patients and their friends towards the cost of maintenance amounted to £1319, and the governors expect that when it is more widely known that patients are expected to contribute according to their means towards the cost of their maintenance, the payments will steadily increase. Sir Charles O'Brien Harding announced that Mrs. Fosdick had given £100 for an extra X ray apparatus in memory of her husband.

Correspondence.

"Audi alteram partem."

PHYSIOLOGY AND THE PRACTITIONER.

To the Editor of THE LANCET.

SIR,—A well-known orthopædic surgeon recently asserted in my hearing, with apparent satisfaction, that as a student he knew little about the anatomy and physiology of the pons and medulla and that what he then knew he had since forgotten. And yet anatomy and physiology are the basis of scientific medicine. In physiology, at any rate, new facts of some importance are being discovered every month, although it may be years before they are brought to notice of clinicians even of the consultant class and in large towns. This state of matters is partly due to slackness on the part of the clinicians, but I think quite as much to the aloofness of the scientists, who are apt to underrate the knowledge and intelligence of the practitioner.

To remedy this deplorable delay in the spread of useful knowledge I would offer the following suggestions: (1) There should be a chemical, an anatomical, and—most needed of all—a physiological section of the Royal Society of Medicine; to which scientists should be encouraged to contribute abstracts of progress in their particular departments. (2) The medical journals read by clinicians should, like the *Journal of the American Medical Association*, publish week by week reviews of scientific progress by first-class men. If suggestion (1) were carried into effect it might only be necessary to report accurately the proceedings at the scientific sections.

I am, Sir, yours faithfully,

London, S.W., March 18th, 1924. THOMAS LUMSDEN.

*** We deal with this letter in a leading article. —ED. L.

CERTIFICATES OF INSANITY.

To the Editor of THE LANCET.

SIR,—A letter in the *Times* of March 17th, headed Certification of Lunacy, should, I think, not pass unnoticed. In it certain suggestions are made, the first being that "local boards of mental hygiene" should be set up consisting of two doctors, two barristers, and two county councillors. To this board all persons in "observation wards" are to have a right of appeal, either personally or by counsel, and by it the question of their sanity is to be determined. It may well be hoped that the process of certification and ordering reception may become, for the protection of the medical practitioner, a more definitely judicial function than it is at present, but it is obvious that such a board, inspiring, from the nature of its heterogeneous composition, but little confidence, would be unwieldy, slow in operation, and of an insufficiently magisterial character. Any of us acquainted with the rapid and decisive action that is often required can picture a board dealing either with the acute maniac, or the argumentative paranoiac, and can imagine the queer results that would emerge.

The second suggestion is that general hospitals and Poor-law infirmaries should be provided with "observation wards" to which all "alleged lunatics' private or pauper," should be sent in the first instance. That general hospitals would do well to provide accommodation for certain types of mental illness is, I suppose, generally admitted, but to send all "alleged lunatics" to "observation wards," whether in general hospitals or in infirmaries, for a preliminary survey would be fantastic. It is our constant complaint that early stages of mental illness in the majority of cases pass unnoticed or are misinterpreted by both the patient and his friends. When a stage arrives at which the friends take action, there is seldom any kind of doubt that the patient is mentally deranged; no further observation is needed to establish the nature

of the malady, and the sooner consistent and uninterrupted treatment begins, the better. It is in a very small number of cases that any doubt arises or in which prolonged observation is indicated. To send every case, "public or private," to an "observation ward" would be to herd together in unconscionable fashion all sorts of persons who should decidedly not be together in the same wards, or, indeed, in "wards" at all; unless the term "observation ward" is to be so extended as to imply a mental hospital so equipped that patients could be classified according to their symptoms and placed some in one ward or private room and some in others. Expense alone would forbid such a mode of dealing with cases for the sole purpose of "observation."

A further suggestion, involving considerable cost, is that the opinion of an independent alienist should be sought in all cases in which a patient is considered to have mental symptoms. It may again be pointed out that in most cases the symptoms are as plain as a pike-staff to any layman, and it is just because they are so plain that the relatives have been moved to act. It is only in a very small proportion of cases that, so far as certification to facts indicating mental disorder is concerned, the opinion of a specialist is desirable. Another suggestion is that the patient should see his certificates. I am inclined to wonder if the author of the suggestion makes any distinction between the normal and the disordered mind. If a patient is capable of cognition of a certificate and can appreciate the character of the data upon which it is founded, he cannot, in most cases, be regarded as insane. If I certify that a patient is confused and disorientated, it means that his perceptions are too disordered to understand what a certificate is; or if I certify that he has delusions, it means that certain of his thoughts, of very real validity to himself, are morbid and that he cannot think healthily. What point is there in showing certificates to such patients? A much more important point is one which anyone with a small knowledge of mental disorder should be able to understand—namely, that in many cases to show a certificate to a patient would be the worst possible treatment and would intensify the symptoms.

It is unhappily the case that bizarre views are often attractive to a very large section of the public, while commonplace facts are uninteresting. This may account for the non-appearance (up to the present date) of any letter in rebuttal. I am, however, sure that the suggestions made will not be acceptable to those of knowledge and experience.—I am, Sir, yours faithfully,

Harley-street, W., March 24th. E. D. MACNAMARA.

To the Editor of THE LANCET.

SIR,—Obviously there is a wide difference of opinion as to the status of certificates of insanity. Dr. R. Eager seems to imply that the "grounds" of certification should be concealed from patients for fear of directing their resentment against the medical men who certified them, and he suggests that this view is general in the profession. Of course, as you pointed out in a leading article, these certificates are not the means of continued detention, and so, perhaps, are not very important, but I cannot believe that a rule of secrecy is justified. It is not feasible to prevent paranoiacs and hypomaniacs from learning who certified them, and concealment of the reasons for certification merely lends colour to their mistrust. The feeling that he is being wrongly, or at least capriciously, dealt with and has therefore no security for future liberation, the lack of confidence in the asylum medical staff, and the lack of insight into his own abnormality, are the three points on which a certified patient is at a disadvantage compared with a voluntary one who seeks treatment from the physician he chooses. Perfect frankness is necessary to overcome these difficulties and to establish a therapeutic relationship with a certified patient. From the purely medical point of view, therefore, no less than from that of public policy, it would seem that the less secrecy the better.—I am, Sir, yours faithfully,

Perth, March 22nd, 1924. IAN D. SUTTIE, M.B.

THE FAMILIAL OCCURRENCE OF ADDISON'S (PERNICIOUS) ANÆMIA.

To the Editor of THE LANCET.

SIR,—In their paper on the Relationship of Some Hæmolytic Disorders to Pernicious Anæmia, published in THE LANCET of March 15th, Drs. P. N. Panton, A. G. Maitland-Jones, and G. Riddoch describe a case of probable pernicious anæmia, in which a history of the disease was obtained in two and, perhaps, three other members of the family, and they refer to other examples of the familial occurrence of the disease recorded by Bartlett, Patch, and Minot. I have been able to collect no less than 40 examples of familial Addison's (pernicious) anæmia from the literature and have met with two similar cases myself. I have also had a patient with subacute combined degeneration of the spinal cord, who eventually die from Addison's anæmia, whose grandfather, father, paternal uncle, and brother died of the anæmia, and another patient with this nervous disorder, associated with achlorhydria but no anæmia, whose grandfather died of Addison's anæmia, and Willson has recorded a similar case.

Two additional examples of familial Addison's anæmia have been described respectively by Faber and Schauman, in which other members of the family had achlorhydria but no anæmia. Among 16 families, of which one member was in Martius's clinic on account of pernicious anæmia and others were given test-meals, complete achlorhydria was discovered in one or more of the healthy members in 11 families. In two out of three patients with normal blood, who were under my care on account of other diseases, in whom a test-meal was given because a relative had died of Addison's anæmia, complete achlorhydria was discovered.

My own cases and those recorded by others do not show that familial cases of Addison's anæmia differ in any way from ordinary cases, as suggested by Panton and his colleagues as a possible explanation of the familial history in their anomalous case of anæmia.

These facts seem to me to be strong evidence in favour of the view that familial pernicious anæmia is a result of familial achlorhydria, which Albu and Jung have shown, and my own experience confirms, may exist quite apart from the occurrence of anæmia in the same family. A comparison between the frequency of achlorhydria in normal adults and the death-rate from Addison's anæmia of the adult population shows that about 1 in 6 of people over 20 with constitutional achylia ultimately develop the anæmia. It is therefore not surprising that more than one member of a family with constitutional achylia should sometimes develop Addison's anæmia, subacute combined degeneration of the cord, or both.

I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, March 17th, 1924.

To the Editor of THE LANCET.

SIR,—I have read with great interest the important series of cases recorded in your issue of March 15th by Drs. Panton, Maitland-Jones, and Riddoch, but would venture to ask for some more coherent line of approach to the problems which they present. There are now on record quite a large number of curious types of blood disease, of each of which two or three examples have been described, but of which the pathology remains obscure. To these Dr. Panton and his collaborators add, amongst others, the clinical type described in their Group 1. The details given are brief but the syndrome appears to be characterised by a long course, anæmia, jaundice, hæmoglobinuria, thrombosis, and in Case 1 by sepsis and splenomegaly.

It is to the commentary on these cases that I wish to take exception on the grounds that it embodies a false line of approach. It opens with the query, "the question arises as to the category in which these two cases are to be placed," and three possible

categories are discussed. It is surely legitimate to point out that no critical examination of cases can be of value if it presupposes that they must be placed in some already existing category. This difficulty seems to have been apprehended by the authors, for on the next page we find the remark, "for the present we prefer to place the two cases here described in a separate category," but this is, unfortunately, followed by a definite statement on their pathology which lacks, as far as can be seen, any sort of support beyond mere conjecture. This statement is as follows:—

> "The difference, however, between this condition and pernicious anæmia is apparently *one of degree only*, the phases of slow blood destruction responsible for the relapses of pernicious anæmia being accentuated by short sharp bursts of blood destruction in which the quantity of hæmoglobin liberated is so large that it is excreted as such in the urine." (Italics are mine.)

The "slow blood destruction" of pernicious anæmia takes place in the portal system according to Hunter, whose work has not yet been controverted. The products of hæmolysis are accordingly trapped in the liver and iron is there deposited in large amount. It is now suggested that if only that hæmolysis can be shorter and sharper than usual, the products will pass the liver unchanged and be excreted through the kidneys. This seems rather improbable, and it is certainly a novel suggestion. It will also be noticed that the statement quoted assumes that the speed and amount of hæmolysis determine hæmoglobinuria. Most authors have thought that it is the site and not the amount of hæmolysis which matters, and they have given good reasons for their belief. Why are their findings tacitly assumed to be of no value?

The fifth group described in the paper consists of a single case. The commentary commences: "The diagnosis in this case would appear to rest between pernicious anæmia and acholuric jaundice, and if we confine ourselves to these alternatives the evidence favours that of pernicious anæmia." May I suggest that there is no particular reason why a patient who has had his spleen removed for acholuric jaundice and who has a strong family history of this condition should not later suffer from pernicious anæmia? This would appear to be the most obvious explanation of the facts set out, and it is hardly affected by the diagnosis of "pernicious anæmia" in two of his relatives since that term has quite often been applied to acholuric jaundice because of the similarity in the blood pictures.

Finally, I would ask that the term "pernicious anæmia" may be used with some definite meaning, either as applying solely to a particular blood picture (which is not specific to any one clinical condition) or else as applying only to a particular clinical entity (Hunter's, Addisonian or glossitic anæmia) of which the blood picture in question usually forms part. The failure to make this distinction renders valueless a diagnosis of pernicious anæmia alone and this difficulty frequently arises. My own habit is to restrict the unqualified term to the clinical entity, and I believe that this is generally convenient.

I am, Sir, yours faithfully,

Sevenoaks, Kent, March 19th, 1924. GORDON WARD.

DOCTORS AND ADVERTISING.

To the Editor of THE LANCET.

SIR,—My recent essay [1] has brought evidence of very general agreement with the expressed view that intelligent advertisement may be not only proper but even desirable, and that its recognition as advertisement is independent of the question of payment.

Among the interesting comments which have reached me are some which relate to an incidental reference made to the steady State encroachment upon the private practitioner's preserves; and certainly there seems a growing divergence between the material interests of the individual practitioner and of medical bureaucracy in its most intimate form, the municipal health officer. We resolutely bolt and bar the door to a State service but are apt to overlook the activities of the fluent gentleman with the jemmy at the basement window. I, too, share the belief that free antivenereal treatment is the "thin edge," adroitly chosen as calculated to enlist the sympathy of the well-intentioned but less well-informed, in addition to the customary support from "reformer" and "anti" elements.

I see no possible objection to Dr. Wansey Bayly's suggestion that the names of competent specialists be made more accessible to the public through a special register or the suitable adaptation of an existing publication. Such a list could readily be corrected by the General Medical Council, as a non-partisan tribunal, with whom it would rest to decide whether a proponent's opportunities and experience in a definite branch of practice had been such that he might properly style himself a specialist therein. I take it that Dr. Bayly did not intend to convey that, *training and experience apart*, only those who maintain a hospital connexion are eligible to be described as specialists, for such a restriction would be manifestly unfair, and carries a suggestion of vested right or proprietary interest reminiscent of less enlightened times. It might be susceptible of being so interpreted that those who for reasons of age, health, increasing practice, and so forth, have relinquished hospital connexion cease ipso facto to be specialists. The recent graduate might be eligible for description as a heart specialist, but not so the outstanding figure of contemporary British medicine.

I am, Sir, yours faithfully,

London, March 21st, 1924. H. D. L. SPENCE.

[1] THE LANCET, Feb. 23rd, p. 423.

THE WASSERMANN REACTION IN THE NEW-BORN.

To the Editor of THE LANCET.

SIR,—May I be permitted to make a comment upon your leading article on the Effect of Maternal Syphilis on the Death of the Child appearing on p. 608 of to-day's issue? There is a point with regard to the significance of the Wassermann reaction in the new-born child which, since it appears to have escaped your notice, I have, perhaps, not stated with sufficient clarity in my report to the Medical Research Council.[1] I refer to the fact that in the series of cases re-examined at intervals varying from three weeks to 20 months after birth very striking alterations in the Wassermann reaction were found. While those infants which had been born with a negative reaction remained negative, *the majority (over 90 per cent.) of those born with a positive reaction lost that positive reaction*, even though it was still obtainable in the blood of the mother.

This disappearance of a positive Wassermann in the infant is a phenomenon to which attention was drawn by P. Fildes in a report to the Local Government Board in 1915. As his interpretation of the significance of the Wassermann reaction in the new-born has been very largely overlooked, and, indeed, has been directly traversed by certain writers,[2] I think the confirmation of it in my series of cases is worthy of note. That there is need to emphasise this is demonstrated by the fact that you, Sir, to judge from the second last sentence in your article, appear to regard a record of a positive Wassermann reaction in an infant as a synonym for syphilitic infection.

As I have pointed out on p. 65 of the Report referred to, (*a*) a positive Wassermann reaction in a new-born infant is of no value in diagnosis, and (*b*) the incidence of congenital syphilis is very much less than many purely serological studies have indicated within recent years.

[1] Maternal Syphilis as a Cause of Death of the Fœtus and of the New-born Child. Special Reports, No. 82. H.M. Stationery Office. 1*s*. 6*d*.

[2] S. M. Ross and A. F. Wright: THE LANCET, 1921, i., 962.

The results of the considerable series of post-mortem examinations recorded in the Report not only support these contentions, but also demonstrate that many of the signs supposed to be characteristic of congenital syphilis are quite inconstant in their presence in definitely syphilitic infants, while others are not confined to syphilitic cases. Finally, may I say that the clinical examination of the infants which have been followed up confirms the conclusion that a *positive Wassermann reaction in the child at birth cannot be taken as an indication that the infant is syphilitic.*—I am, Sir, yours faithfully,

Glasgow, March 22nd, 1924. J. N. CRUICKSHANK.

*** We are glad to publish Dr. Cruickshank's letter, since in our leading article it was not possible to take up more than a few of the interesting results obtained from his exhaustive inquiry. The interpretation of the Wassermann reaction in the newly-born is, as Dr. Cruickshank contends, a point around which controversy has centred, and we pointed out earlier in the article to which he refers that he, as well as other workers, have found it to be untrustworthy as an indication of infection.—ED. L.

A CRITICAL EXAMINATION OF PSYCHO-ANALYSIS.

To the Editor of THE LANCET.

SIR,—The review of my book with this title in your issue of Feb. 16th has only just come to my notice. Your reviewer charges me with arguing in a circle. He says: "Many observers have found themselves obliged to assume that mental processes take place without the subject being aware of them, and the author's dismissal of this assumption as being nonsensical is a *petitio principii*, though he tells us that psycho-analysts produce not a shred of proof, only assertions." I do not merely *tell* my readers this, but I give actual examples, where Freud makes an assertion and defends it on the ground of plausibility, and then on the next page calls it a "fact," or says: "as I have shown, or demonstrated, &c." Where, then, is the *petitio principii?* I cannot philosophically disprove the existence of the "unconscious" any more than your reviewer can disprove the existence of a green cow walking on its horns on the other side of the moon, but that does not prove the existence of either the "unconscious" or of the green cow. Wundt, Wm. James, Ziehen, Külpe, and many others have shown that the assumption of an unconscious is quite unnecessary.

If psycho-analysts were to agree that by "unconscious" nothing else is meant than neurone-dispositions there would be little to quarrel about. However, what appears to me far more important, and what psycho-analysts, as well as your reviewer, are most careful to avoid, is the fact that I have shown, I believe conclusively, that their methods of penetrating into the assumed "unconscious" are fallacious. Psycho-analysts always forget the control experiments (vide pp. 95 sq. and 214 sq.). Your reviewer also complains that I mention no references for the statement that "some authorities have pronounced themselves against this method (of reviving the lost memories of painful experiences) in no equivocal manner." I gave, however, an abstract of Pierre Janet's case of Marie which confirms my contention, and Otto Binswanger "Die Hysterie" (Wien, 1904), pp. 908–910, is especially emphatic on this point. After referring to the views of v. Krafft-Ebing, Löwenfeld, and Brodmann, Binswanger concludes: "The revival of old memories has the contrary effect. An emotional storm is unfettered whose consequences are quite incalculable, which not only intensifies symptoms already present, but also produces new ones." I am, Sir, yours faithfully,

A. WOHLGEMUTH.

Shortlands, Kent, March 22nd, 1924.

*** Dr. Wohlgemuth's courteous letter largely confirms the review, while he has, of course, a perfect right to his own opinions.—ED. L.

MEASLES INFECTION: REASONABLE METHODS OF PREVENTION.

To the Editor of THE LANCET.

SIR,—The Sydenham District Medical Society, which is composed of general practitioners mostly of many years' standing, at a recent meeting considered the question of the spread of infectious diseases and came to the following conclusion:—

"There is no evidence of second attacks of measles or of the conveyance of the disease by healthy immune individuals sufficient to justify the existence of a rule forbidding any person from attending school or office from a house in which there is a case of the disease provided satisfactory medical evidence of a previous attack is forthcoming."

This opinion was agreed to unanimously, and I was requested to communicate it to you with the hope that a discussion of the subject by a wider circle might lead to the abolition of rules which are probably unnecessary and often entail considerable hardships on individuals.

I am, Sir, yours faithfully,

H. M. STEWART,
Hon. Secretary, Sydenham District Medical Society.

Dulwich, March 24th, 1924.

TESTS FOR CURE OF GONORRHŒA IN WOMEN.

To the Editor of THE LANCET.

SIR,—I was much interested in the comments of Dr. P. Fildes and Dr. G. T. Western on my paper. Briefly, they state that in some 200 examinations of cultures and smears in women they found 25 per cent. positive in culture, and 20 per cent. in smear. From this they draw the conclusion that cultures are preferable to smears as a routine test.

I am somewhat puzzled as to what exactly the figures quoted by them mean. As my paper was on "Tests for Cure"—and this appears above their letter—it reads as if cases considered clinically cured at the London Hospital, and sent up for a bacteriological test, were found still infected in these proportions. I cannot think Drs. Fildes and Western can possibly mean this; but that, writing with the detachment of bacteriologists when clinical matters are concerned, they are really stating that in some 200 specimens, examined at various stages of the disease, they got the results mentioned. No indication is given as to how many patients these 200 results represent—whether 20 cases examined 10 times, or 200 examined once; nor do they say if the smears were taken in the manner indicated, and with the precautions suggested by me, in the paper criticised. I am still unrepentant in my statement that I have found smears preferable to cultures in testing for the presence of the gonococcus in women.

This statement is the result of the examination of some thousands of women in all stages of the disease, and has been arrived at after a good many years of observation. I have had runs of success with cultures. I have seen runs of failures with smears. A new clinical assistant or house surgeon until drilled often got extremely poor results. I hold no brief for smears taken in any way except as indicated in my papers. I should like Drs. Fildes and Western, therefore, to give smears another trial following that technique.

The whole subject is such a difficult one, the risk of missing the gonococcus, using every known precaution, is still so great, that no method should be neglected which has given success in the hands of others. If Drs. Fildes and Western will examine 1000 women in the manner used by me, and compare the percentage success with cultural results, they may alter their opinion.

I am, Sir, yours faithfully,

J. JOHNSTON ABRAHAM.

Harley-street, W., March 21st, 1924.

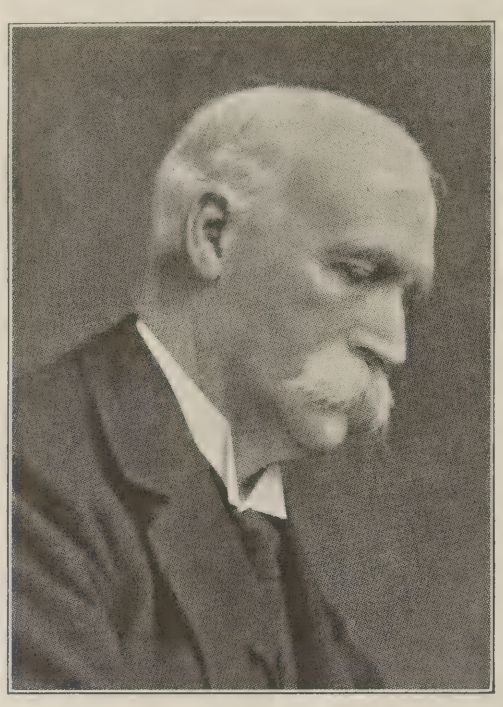
Obituary.

SIR WILLIAM MACEWEN, F.R.C.S. ENG. & IREL., F.R.F.P.S. GLASG., F.R.S., D.C.L., &C., C.B.,

REGIUS PROFESSOR OF SURGERY, UNIVERSITY OF GLASGOW.

WE much regret to announce the death of the famous surgeon and professional leader, Sir William Macewen, which occurred on Saturday last, March 22nd, at his residence in Glasgow, in his seventy-sixth year.

William Macewen was born on June 22nd, 1848, his father being in the mercantile marine, and at one time master of a yacht, while he was also engaged in commercial undertakings in Rothesay. The great surgeon was the youngest child of a large family and his



SIR WILLIAM MACEWEN.

early life was passed in modest circles. After elementary instruction in Rothesay, he completed his education at the Collegiate School at Glasgow before entering the University. Without obtaining academic honours he worked steadily, and by the time he was of age he had graduated at the University as M.B., C.M. After holding residential appointments, including the house surgeoncy at the Royal Infirmary under Sir George Macleod, he proceeded in 1872 to the M.D. degree, and then for a period he studied at some of the big schools on the continent. Returning to Glasgow he went into private practice and had excellent experience in dispensary work. His chance came when he was elected assistant surgeon to the Royal Infirmary. He had now become an ardent disciple of Listerian principles, perceiving that in every direction they promised untold developments in surgical theory and practice. He had benefited alike by his own practical work and by the excellent training at the University, which enabled him to absorb the lessons and take advantage of the opportunities which the rising science of bacteriology held out. Allan Thompson, Andrew Buchanan, and William Tennant Gairdner were among his teachers, while Lister was engaged in his famous work, first at Glasgow and later at Edinburgh, at the very period when Macewen was inaugurating his great career.

Macewen seems to have been always, though deeply indebted to his training, an independent thinker, and it was during his period of general dispensary practice in Glasgow that he laid the foundation of his clinical knowledge and obtained the resourcefulness that ever marked his practice. His appointment to the Royal Infirmary gave him an opening, which was made wider in a very short period by his becoming in 1877 full surgeon to the institution. This post he held for 15 years, when he succeeded Sir George Macleod, his former teacher, as Regius Professor of Surgery. On the scene of Lister's earliest triumphs—which, it may be added, attracted at first no great attention—Macewen steadily carried out a wonderful work, developing and modifying the antiseptic treatment and becoming a pioneer in particular of brain surgery. The work of Hughlings Jackson and David Ferrier, pre-eminently among others, had brought out the main principles of brain localisation, and Macewen was amongst the first to envisage the possibilities which this knowledge offered under proper application of aseptic methods.

He was probably the first to practise brain surgery in the modern sense of the word, as apart from trephining for injury. In the *Glasgow Medical Journal* of 1879 he published a paper describing how a tumour of the dura mater which had been attended with convulsions was removed after opening the skull with completely satisfactory results. Further contributions followed in THE LANCET on similar work, a paper on monoplegia of the left arm and leg due to cortical lesion forming a good example of his clinical methods; and in 1883 he delivered an address at a meeting in Glasgow of the British Medical Association, taking as his subject the surgery of the brain and spinal cord, which placed him at once in the front rank of surgery throughout the world. The whole subject of brain surgery, as well as his own personal share in its development, was made the subject of his presidential address before the Association in 1922. This contribution to medical science and medical history was published in the *British Medical Journal* and in our own columns, and showed alike how brain surgery had developed pari passu with the efforts of such bold thinkers and expert workers as Ferrier, Horsley, Beevor, Godlee, Gowers, Mott, and Ballance, and how great and independent a place the speaker had himself taken in the work.

Although Macewen's name is mainly associated with brain surgery he was in no sense a specialist, and, as a matter of fact, his earliest work to attract outside attention was in the direction of orthopædics. As early as 1878 a paper was published by him in our columns upon antiseptic osteotomy for genu valgum and genu varum, and other papers followed upon the surgical treatment of osseous deformities and their remedy. He was an innovator in the correction of faulty union of long bones, his method of refracture necessitating a new technique. His success in osteotomies for defective limbs brought about valuable modifications in the operative procedure for various forms of talipes, previously met in an unsatisfactory manner by tenotomies, while his work in bone transplantation was also original, and, both in his hands and as developed in the hands of others, has proved a valuable branch of conservative surgery. A monograph which he published some ten years ago on the development of bones proved the independence and boldness of his views in this province of his science, and the same features marked his work on the surgery of the lung, and the technique which he laid down for dealing with various forms of hernia.

As professor of surgery in Glasgow, Macewen was a great and practical success. He was a man with large views and unsparing of his own time, strength, and money, and he soon got around him brilliant assistants and eager pupils, while honours accumulated thick upon him. Elected a Fellow of the Royal Society, he received honorary Fellowships from the Royal Colleges of Surgeons both in England and in Ireland; he was a D.Sc. of Oxford and Dublin, a D.C.L. of Durham, and an LL.D. of Glasgow and Liverpool. He was elected to the honorary membership of Imperial or Royal Academies and national scientific

societies in France, Germany, Austria, Hungary, Italy, Russia, and the United States, and became President of the International Association of Surgery in 1921. In the following year he was knighted and was elected President of the British Medical Association, being largely responsible for the great success which attended the meeting at Glasgow in that year. He was Honorary Surgeon to the King in Scotland. He received a knighthood in 1902, and was also appointed C.B.

During the war he was one of the first consultants to be appointed by the medical department of the Royal Navy, and was associated from the beginning with the scheme for the establishment of the Home for Limbless Sailors and Soldiers at Erskine. His last journey was undertaken as ambassador of the British Medical Association to the Australasian Medical Congress at Melbourne in November, 1923.

In Macewen the scientific world has lost a great man, who arrived at the head of a learned profession with no extraneous advantages, but by unflinching study and a brave use of unfettered judgment. And his personal appearance coincided exactly with this character. Very tall, handsome, and grave, he commanded without seeking it the immediate attention which philosophers less well endowed physically must struggle to obtain. We reproduce with permission the portrait which appeared in the *British Medical Journal* in October, 1922.

Sir William Macewen married Mary, daughter of Hugh Allan, of Govanhill, by whom he had six children, three daughters and three sons. And it may be mentioned that all the sons entered the medical profession, two being decorated for war work. He was throughout his busy life devoted to the countryside of his birth, and it was a source of real gratification to him when the freedom of the borough of Rothesay was conferred upon him in the courtyard of the ancient castle ruins. In his later years he had purchased a property in Kingarth, where he became a scientific and successful farmer as well as a keen researcher on many biological and veterinary problems. A good example of his fruitful interest in such by-paths was furnished by his study of the antlers of the deer, which was an elaborate essay on bone physiology.

HENRY RUNDLE, F.R.C.S. ENG.

Henry Rundle, consulting surgeon to the Royal Portsmouth Hospital, died on March 19th at Southsea in his eightieth year. Rundle began his medical study as apprentice to the late Mr. W. J. Square, of Plymouth, going on to St. Bartholomew's Hospital, London, whence he became M.R.C.S. Eng. in 1865 and F.R.C.S. in 1870. In the latter year the British Red Cross Society sent out six surgeons to the aid of sick and wounded on either side in the Franco-Prussian War, and Rundle was selected as one of them, proceeding with Mr. W. E. B. Atthill and Mr. J. C. Galton to Berlin first and then to the "Alice" Hospital at Darmstadt, founded under the auspices of Princess Louise of Hesse-Darmstadt (Princess Alice of England), which provided a reserve hospital for the Hessian Division of the Prussian Army. Rundle also served for a time in the neighbourhood of Strasbourg, towards the end of the historic siege of that city, which he entered very shortly after its capitulation. For his services to the wounded of both German and French armies, Rundle received the German War Medal, the Hessian Cross, and also the French War Medal. He was probably the only recipient of both French and German war medals in Europe.

On returning to England after the war Rundle became house surgeon to the Royal Hants County Hospital at Winchester, proceeding thence to Southsea, where he settled down in general practice and commenced his long association with the Royal Portsmouth Hospital, first as assistant surgeon and then as surgeon, retiring in 1908 but remaining in a consulting capacity. His health was latterly feeble and he led a quiet retired life—he was a bachelor—during the last 14 or 15 years, but retained his mental vigour to the end. He was the author of "With the Red Cross in the Franco-German War," and for many years a valued contributor to our columns on matters of local interest.

Of a peculiarly honest, plain-spoken, and kindly disposition, Henry Rundle made firm friendships and won general respect and esteem. The Royal Portsmouth Hospital loses in him a devoted friend.

THOMAS HILL JAMIESON, M.D., M.R.C.P. EDIN.

Dr. T. H. Jamieson, Deputy Commissioner of Medical Services in Tropical Disease under the Ministry of Pensions, whose death occurred recently in London at the age of 50, was a graduate of the University of Edinburgh, where he qualified M.B., C.M. in 1894, and there later he gained the degree of M.D. He also was admitted a Member of the Royal College of Physicians of Edinburgh in 1915. After holding his first appointments as house surgeon to the Huddersfield Infirmary and then to the Children's Hospital, Liverpool, he went to the Far East and settled in Penang, Straits Settlements, where he built up an extensive practice. After many years of strenuous work in the tropics his health began to fail, and he finally returned to England in 1917. He was rejected for service abroad, but was appointed to the Fourth London General Hospital R.A.M.C.(T.) as specialist in malaria and other tropical diseases. In 1919, having obtained the D.P.H. London, he joined the medical staff of the Ministry of Pensions, where, in virtue of his special knowledge of tropical disease, he held the appointment of deputy commissioner with administrative charge of the tropical clinics in the S.E. region. Later he became visiting physician to the Ministry's Hospital at Orpington, Kent, and to Queen's Hospital, Sidcup. For his services he gained the honour of M.B.E.

A friend on the Pensions medical staff writes:—

"Dr. Jamieson was outstanding in his clinical judgment and acumen, and enthusiastic in all his work. By his unfailing courtesy and kindness he won the confidence of colleagues, staff, and patients, many of whom at their own request attended his funeral service at Golders Green. His broad sympathies and wide outlook on the problems of the day, with all the political questions so immediately affecting national life, made him a companion to be sought and prized. Politically he inclined to many of the aspirations of the Labour Party."

To his widow we extend our sincere sympathy.

HERBERT LEYLAND SACKETT, M.B., B.S. LOND., F.R.C.S. ENG.

Mr. H. L. Sackett, clinical assistant, St. Bartholomew's Hospital, died on March 21st after a very brief illness, at the age of 30. Vigorously pursuing his surgical work until midnight on March 13th, he complained of feeling very ill and had a rigor. It was then discovered that one thumb was inflamed. Treatment was immediately carried out, but despite all efforts the trail of septicæmic symptoms followed. The tragedy was heightened by the fact that in another ward of the hospital lay his father, the Rev. Walter Sackett, suffering from erysipelas. Father and son died within a few hours of each other. As a boy Mr. Sackett suffered from spinal trouble and for months laid recumbent. During this time his ever active mind was gleaning lore of every kind. His years at St. Bartholomew's were years of triumph. As a student he won the Bentley prize; he became a house surgeon, and later intern midwifery assistant. Last year he gained his F.R.C.S., obtained a research scholarship, and has been engaged for many months in original work on intestinal obstruction. In January of this year he was appointed a surgical clinical assistant. He was for more than two years editor of *St. Bartholomew's Hospital Journal*, and as a student was President of the Christian Union.

Mr. Sackett was not only a surgeon of great promise, but a man of the highest type. His kindness endeared him to his patients, and his amazing thoroughness and devotion to duty caused him to be deeply respected by all who came in touch with him.

Medical News.

UNIVERSITY OF OXFORD: *Radcliffe Travelling Fellowship.*—The Master and Fellows of University College announce that the trustees have elected Charles Frederick Terence East, M.A., B.M., B.Ch., M.R.C.P., New College and King's College Hospital, to a Radcliffe Travelling Fellowship of £300 for two years.

The following degrees in medicine have recently been conferred :—

Doctor of Medicine.—S. C. Dyke and J. J. Conybeare.
Bachelor of Medicine.—H. A. Robertson, E. B. Strauss, Jean Orr-Ewing, B. G. Scholefield, and R. V. Facey.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful :—

FINAL EXAMINATION FOR DEGREES OF M.B. AND CH.B.

Part I.—M. M. F. Arthur, Ethel Barrow, E. I. Bieber, H. M. Boston, G. E. Church, N. L. Corkill, O. Dawood, J. L. Donnelly, F. R. Faux, Dorothy A. Gough, J. Graham, R. I. Greenshields, J. Hatton, E. Hughes (with distinction), F. P. Irvine, D. Katz, B. Kay, J. E. S. Lloyd, W. J. Lloyd, H. McGrath, Isabel McKee, D. J. T. Magowan, D. Roberts, J. Tarshish, I. Thomas, and J. E. Walker.

Part II.—T. A. Clarke, N. J. Crawford, H. L. Cullen, I. Gordon, A. J. Goss, Catherine E. I. Greenshields, Sarah Leigh, G. W. Paton, F. B. Shevlin, and B. J. S. de Villiers.

DIPLOMA IN PUBLIC HEALTH.

A. C. Crawford and Mary A. Thomas.

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

J. D. Ingram, J. S. Kellett-Smith, W. J. MacHugh, H. Miller, and R. E. Sadleir.

UNIVERSITY OF DURHAM: *Faculty of Medicine.*—At recent examinations the following candidates were successful :—

THIRD EXAMINATION FOR LICENCE IN DENTAL SURGERY.

Anatomy, Physiology, and Histology; Dental Anatomy, Dental Histology, and Dental Materia Medica.—Thomas E. Coulson, Lionel G. Dewar, Wilfred A. Gale, Frederick J. Gilbertson, Wilton L. Milburn, Robert Moody, and Norman Wilkinson.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated :—

Surgery.—A. Kotbi, St. Mary's Hospital, and D. G. Robinson, Guy's and Charing Cross Hospitals.
Medicine.—F. H. Armanious, St. Thomas's Hospital; M. K. El Khadem, Liverpool; and W. H. G. M. Ling, Edinburgh and St. Mary's Hospital.
Forensic Medicine.—E. J. Creais, St. Mary's Hospital; C. E. Donaldson, Cambridge and St. Mary's Hospital; R. D. Jones, Edinburgh and Middlesex Hospital; W. H. G. M. Ling, Edinburgh and St. Mary's Hospital; J. P. McGuire, St. Mary's Hospital; J. G. E. Vachell, Cambridge and St. George's Hospital; and A. J. Vickery, St. Mary's Hospital.
Midwifery.—W. B. Arnold and J. O. W. Bland, St. George's Hospital; W. H. G. M. Ling, Edinburgh and St. Mary's Hospital; and J. G. E. Vachell, Cambridge and St. George's Hospital.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: M. K. El Khadem, W. H. G. M. Ling, and A. J. Vickery.

BRITISH MEDICAL ASSOCIATION: SCHOLARSHIPS AND GRANTS.—The Council of the British Medical Association is prepared to receive applications for *Research Scholarships* as follows :

1. An Ernest Hart Memorial Scholarship of the value of £200 per annum, for the study of some subject in the department of State medicine.

2. Three Research Scholarships, each of the value of £150 per annum, for research into some subject relating to the causation, prevention, or treatment of disease.

Each scholarship is tenable for one year, commencing on Oct. 1st, 1924. A scholar may be re-appointed for not more than two additional terms, and may hold a junior appointment at a university, medical school, or hospital, provided the duties of such appointment do not interfere with his work as a scholar.

Grants.—The Council is also prepared to receive applications for grants for the assistance of research into the causation, treatment, or prevention of disease. Preference will be given, other things being equal, to members of the medical profession and to applicants who propose as subjects of investigation problems directly related to practical medicine.

Applications for scholarships and grants should be made not later than June 7th. Applicants are required to furnish the names of three referees competent to speak as to their capacity. The conditions are fully stated in the regulations, a copy of which will be supplied on application to the Medical Secretary of the Association, 429, Strand, London, W.C. 2.

HARNETT *v.* BOND AND ADAM.—The date of the hearing of the appeal in this case has been postponed until April 7th.

THE Cambridge University Press will shortly publish a reprint, in its original form, of Sir Michael Foster's "Lectures on the History of Physiology during the Sixteenth, Seventeenth, and Eighteenth Centuries," which has been out of print since 1922.

QUEEN'S UNIVERSITY (BELFAST) CLUB, LONDON.—A dinner will be held in the Connaught Rooms, Great Queen-street, London, W.C. 2, on Thursday, April 10th, at 7.30 for 8 o'clock. Prof. Thomas Sinclair, President of the Club, will take the chair. The charge for the dinner will be 12*s.* 6*d.*, inclusive of gratuities but exclusive of wines, which sum will be collected during the evening. Old students intending to be present are requested to notify the hon. secretaries at 152, Harley-street, London, W., to this effect not later than April 7th.

CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.—The members' congress will be held from April 3rd–5th. On April 3rd, at 11 A.M., Professor Winifred Cullis will lecture on Internal Secretions: Integration of the Body by Chemical Agencies, and at 6 P.M. Miss A. M. Hallam will lecture on Psychology in Every-day Life, at the Wigmore Hall, Wigmore-street, London, W. 1. At 3 P.M. representative work in the various departments of Chelsea College of Physical Education will be shown to members. On April 4th, at 10.30 A.M., demonstrations of treatments will be given in the Botanical Theatre, University College, Gower-street, London, W.C. 1. At 2.30 P.M. a lecture-demonstration on patients under treatment will be given by Mr. W. H. Trethowan in the Physiological Theatre, Guy's Hospital, S.E. 1, and at 6 P.M. Mr. L. E. Barrington-Ward, F.R.C.S., will lecture on Pseudo-paralysis in Children at the Wigmore Hall. On April 5th, at 11 A.M., Dr. J. B. Mennell will speak on Post-maternity Work, also at the Wigmore Hall. The annual meeting of the Society will be held on April 5th, at 2.30 P.M., at the Court House Restaurant, 1, Marylebone-lane, Oxford-street, W. 1.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.—The tenth annual conference will be held in London on July 3rd and 4th. The main subject under consideration will be the Part Played by Training Colonies in the Treatment of Tuberculosis, and the conference will take the form of a practical demonstration of the work carried out at the training colony, founded and maintained by the National Association at Burrow Hill, Frimley. This colony is included in the scheme of the Ministry of Pensions, and has 60 places for the treatment and training of tuberculous ex-Service men who have already received sanatorium treatment. The courses of training comprise: (*a*) carpentry, (*b*) market gardening, poultry, pig and bee keeping, including light farm work. There is also a sanatorium block of 20 additional beds. Arrangements will be made for the conveyance of members of the conference from London to the colony. After the demonstration a discussion will be opened by Dr. A. H. Macpherson, and the discussion will be continued on July 4th at the Robert Barnes Hall, 1, Wimpole-street, London, W. 1. Further particulars may be obtained from the Secretary of the Association, at 20, Hanover-square, London, W. 1.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The London Temperance Hospital, Hampstead-road, as previously announced, is giving a two weeks' intensive course from Monday, March 31st, to Saturday, April 12th, consisting of practical demonstrations each morning from 10.15 to 12.15, and in the afternoon from 2 to 4 P.M. ward rounds and out-patient clinic. Lectures, open to members of the profession, will be given daily at 4.30 P.M., the first being given by Sir Humphry Rolleston on March 31st on Jaundice. Other lecturers for the week are: Dr. Porter Parkinson, Heart Disease in Children; Mr. Herbert Paterson, Surgical Treatment of Dyspepsia; Dr. David Somerville, Gastro-enterology (I.); and Mr. Lawson Whale, Otorrhœa and its Treatment. Special demonstrations will be given on Fevers on Thursday morning at the North-Western Fever Hospital, on Mental Diseases at Bethlem Royal Hospital on Saturday morning, and in Ophthalmology at the Royal Westminster Ophthalmic Hospital in the afternoon. Beginning on March 31st a three weeks' course in Ophthalmology will be held at the Royal Westminster Ophthalmic Hospital. Clinical instruction will be given every afternoon from 2 P.M., and special demonstrations in medical ophthalmology and methods of examination will be given on Tuesdays and Thursdays. Copies of the syllabus with further information as to the above courses can be obtained from the Secretary to the Fellowship of Medicine, 1, Wimpole-street, London, W. 1.

WELFARE OF THE DEAF.—An important conference of representatives of schools and missions interested in the welfare of the deaf was held under the presidency of Lord Charnwood at the Kingsway Hall, London, on March 19th. Resolutions were passed emphasising the need for the reconstitution of the National Bureau for Promoting the General Welfare of the Deaf on broader lines, so that the claims of the deaf might be authoritatively expressed and nationally met as have been those of the blind, and suggesting that the name of the bureau be changed to the National Institute for the Deaf. Lord Charnwood pointed out the need, in the interests of the general community as well as of the deaf themselves, of some central body which could voice the requirements of the deaf. Mr. A. J. Story called attention to the neglect by the State of the deaf who, he said, were worse off than the blind, for nothing was done for them after the age of 16. A central body should be able to apply pressure on the Government. Mr. T. Mardy Jones, M.P., who said that his interest in the deaf had been stimulated as a result of the conference, advocated the formation of a Parliamentary group in the House of Commons, when ways and means would soon be found of doing something substantial for the deaf. It was announced that both the Prime Minister and the Minister of Health had expressed their sympathy in the conference. Dr. A. Eichholz was present as representing Mr. Wheatley. A conference to draw up a new constitution will be convened at a later date.

TUNBRIDGE WELLS GENERAL HOSPITAL. — The fund earmarked for the purpose of extending this hospital now stands at £8000, and it was announced at the recent annual meeting of the governors that when the figure reached £10,000 plans would be considered. The need for provision for paying patients was emphasised, and an appeal was made for a speedy realisation of the sum needed. During 1923 the number of in-patients constituted a record—viz., 1304, including 525 women, 519 men, and 260 children, a total of 124 in excess of the previous year. The out-patients numbered 4765, an increase of 334 over 1922. The theatre operations totalled 705, and in addition 445 operations were performed in the out-patients' department under a general anæsthetic. There were also 404 dental cases, 24,197 treatments in the electrical department, and 1211 X ray diagnosis and screen examinations. The governors intimated that they had decided to improve and to add to the equipment of the electrical department at a cost of nearly £500, the X ray apparatus to be so improved that treatment for certain cases of cancer would be possible; and that a new expense had been incurred by the insulin treatment for diabetes. The total income amounted to £12,794 17*s.* 6*d.*, and the expenditure £12,990 2*s.* 5*d.*, the excess of expenditure over income being £194 5*s.* 11*d.* It was pointed out that under the conditions now existing an income of £13,000 per annum was needed to run the hospital efficiently. The patients treated during 1923 represented no fewer than 87 towns and villages.

THE SCHICK TEST AT BRIGHTON.—At a sessional meeting of the Royal Sanitary Institute held on March 14th Dr. Duncan Forbes read a paper on the Schick Test and Immunisation against Diphtheria. He mentioned that during the last 23 years there were 5500 cases of diphtheria and 350 deaths in Brighton. Most of the cases occurred between the ages of 5 and 10 years, and most of the deaths also occurred at that time. While the health services could do much in preventing the spread of the disease in families, in residential schools, and, more doubtfully, in day schools, they had been able to do little to prevent the occurrence of epidemics, and it was, therefore, necessary to look for some new means of combating the disease. The most hopeful of recent discoveries was, Dr. Forbes considered, immunisation by toxin-antitoxin. The first task was to discover who were susceptible and who were not susceptible, and this, Dr. Forbes said, could be foretold in many cases by a careful study of the reaction of the Schick test, and steps taken to prevent any great reaction. The cost of testing 50 children with the Schick test worked out at 12*s.* 6*d.*, and to give protection to one child with toxin-antitoxin cost 3*s.* apart from the doctor's time. It would, therefore, Dr. Forbes declared, cost some £300 each year to immunise all Brighton's 2000 one-year-olds, but the cost of such immunisation would be balanced by the saving of over ten lives each year and by all the money that would be saved from nursing in hospital and at home through rather serious illnesses, so that economically it was well worth while immunising even small numbers of children. In Brighton free immunisation was offered to children in the residential institutions, and any mother applying at an infant welfare centre could have her children immunised free of charge. The nurses at the fever hospital, particularly the probationers, were now protected against the disease. Dr. A. Greenwood disagreed with a suggestion by Dr. Forbes, that in applying the Schick test it should not be necessary to consult the parents of the children to be treated, and expressed the opinion that if the parents objected it was possible that an action for assault might lie against the doctor. Dr. Greenwood spoke of the difficulties in carrying out medical inspection of secondary school scholars owing to the objection of parents, and felt sure a vigorous opposition would follow in the case of the Schick test.—Dr. F. C. Linton, Dr. H. P. Newsholme, and Dr. Hugh Stott also took part in the discussion.

Mr. H. D. Gillies is proceeding on the invitation of the Danish Government to Copenhagen for the purpose of treating by prosthesis, or in accordance with their condition, the officers and men who were wounded by the explosion on the Danish cruiser *Geyser* last summer.

NAVAL MEDICAL COMPASSIONATE FUND.—A meeting of the subscribers of this Fund will be held at 11.30 A.M. on April 25th, at the Medical Department of the Navy, 68, Victoria-street, S.W. 1, to elect six directors of the Fund.

THE LATE DR. R. FITZMAURICE. — Dr. Richard Fitzmaurice, who died at Littlehampton on March 11th, aged 72, had lived in retirement since 1909, in which year he completed a quarter of a century's work as medical officer and public vaccinator in the Lindfield district of the Cuckfield Union in Sussex. He was educated at Queen's College, Cork, and the University of Edinburgh, where he qualified L.R.C.P., L.R.C.S. in 1884, and in the same year went to reside at Lindfield. Dr. Fitzmaurice was a laughter-loving Irishman, and the poor folk who formed the main bulk of his patients found in him not only a kindly parish doctor but a real friend.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

National Health Insurance (Cost of Medical Benefit) Bill.

An explanatory memorandum issued with this Bill reads as follows :—

The object of this Bill is to provide the moneys required to meet the balance of the cost of medical benefit and administration beyond the sums provided by s. 7 of the National Health Insurance Act, 1920. For the period from the 1st April, 1922, to the 31st December, 1923, this balance was provided mainly out of the funds of approved societies in accordance with the provisions of the National Health Insurance Act, 1922.

	s.	*d.*
The total cost of medical benefit in England from 1st January, 1924, including doctors' capitation fee, cost of drugs, doctors' travelling allowances, and certain other minor items will be (per insured person per annum)	11	10½
Towards this there is provided from funds of the approved societies by s. 7 of the National Health Insurance Act, 1920, a sum of (per insured person per annum)	9	6
Leaving a balance of (per insured person per annum)	2	4½

Clause 1 (1) (*a*) and (*b*) provide for the payment of this balance for the three years 1924 to 1926.

Clause 1 (2) provides that this balance is to be found from the following sources :—

	s.	*d.*
(*a*) Out of the funds of approved societies, &c. ..	0	2
(*b*) Out of moneys in the Central Fund derived from the unclaimed balance of sums received from the sale of National Health Insurance Stamps..	1	8¾
(*c*) Out of the interest earned on the proportion of insurance funds retained in the National Health Insurance Fund (Investment) Account beyond the prescribed rate (4½ per cent.) credited on moneys standing in that Account	0	6
	2	4½

Under section 3 of the National Insurance Act, 1911, two-ninths of the above sums are payable out of moneys provided by Parliament, the remaining seven-ninths being derived from the contributions out of which the above funds are made up.

Clause 2 provides for the payment into the Central Fund of a further sum of £100,000 from the unclaimed balance in the Stamps Sales Account over and above the proportion of that balance which is normally paid into that fund. This is required in order to enable the sums under Clause 1 (2) (*b*) to be met out of the Central Fund.

Clause 3 re-enacts, as from 1st January, 1923, to 31st December, 1925, the provisions of section 3 of the National Health Insurance Act, 1922, which lapsed on 31st December, 1922, and under which assistance was given to approved societies from the unclaimed balance in the Stamps Sales Account to enable them to pay benefits to members who would otherwise have been suspended from benefit by reason of arrears due to prolonged unemployment.

Clause 4 provides for a corresponding payment to the Ministry of Labour for Northern Ireland out of the Central Fund, which is an international fund common to England, Scotland, Wales and Northern Ireland.

Clause 5 applies the Bill to Scotland and Wales with such modifications as are required in consequence of a difference in the cost of drugs, doctors' travelling allowances, and other minor items in those countries.

The total amounts to be provided in each year for the whole of Great Britain from the various sources under clauses 1 (2) and 5 (including the statutory grant of two-ninths from the Exchequer) are as follows :—

	£
(*a*) Out of the funds of approved societies, &c. ..	118,000
(*b*) Out of moneys in the Central Fund	1,266,000
(*c*) Out of interest income	378,000
	1,762,000

HOUSE OF LORDS.

TUESDAY, MARCH 25TH.

Dogs as a Subject of Medical Research.

Lord BANBURY moved the second reading of the Dogs' Protection Bill, having for its object the exemption of dogs from scientific experiments; in the course of his words he claimed THE LANCET as upholding the statement that dogs were not necessary for experiment. Lord KNUTSFORD moved the rejection of the Bill in an amusing speech in which he prophesied that other peers, especially interested in other animals, might make similar efforts for their exemption. Speaking of the ravages of distemper, Lord KNUTSFORD said that the Bill would stop all research on the subject, and that if dogs could speak he doubted whether they would seek the suggested exemption. Lord LAMBOURNE supported the Bill, when Lord MILDMAY, one of the three lay members of the Medical Research Council, opposed the measure in an excellent speech, in which he informed the House how research for organisms connected, for example, with distemper, foot-and-mouth disease, and swine fever, would be affected by the proposed restriction. Lord RAYLEIGH spoke against the Bill as setting up an obstacle in the way of those who were seeking to penetrate the secrets of disease; and the LORD CHANCELLOR announced that the Government would not favour the measure. Lord CURZON stated that experiments upon dogs had led to incalculable benefits in recent years, in regard particularly to discoveries in connexion with diabetes and rickets; while Lord PARMOOR announced that at the Medical Research Council inquiries were taking place into distemper, in which hopeful progress had been made.

The motion for the second reading of the Bill was rejected without a division.

HOUSE OF COMMONS.

TUESDAY, MARCH 18TH.

Medical Boards and Ex-Service Men.

Mr. FREDERICK GOULD asked the Minister of Pensions whether, in view of the dissatisfaction existing amongst ex-Service men arising from the under-assessment of their disability at the hands of medical boards, he would issue on behalf of his department a circular requesting a more sympathetic and even generous consideration of the cases coming before them for examination.—Mr. F. O. ROBERTS replied: I have no reason to believe that the assessments given by medical boards do not represent a fair and impartial judgment on the conditions of the disability as found on examination. On assuming office as Minister of Pensions I issued a communication to all Members of the Ministry Staff, including members of medical boards, reminding them that the work of the department should invariably be carried out in a spirit of the utmost consideration and sympathy.

WEDNESDAY, MARCH 19TH.

Stone-dusting and Health of Miners.

Mr. CHARLES EDWARDS asked the Secretary for Mines whether he had received complaints of the effects of stone-dusting on the health of miners; whether he was aware that there was no obligation on colliery owners to remove dust, but only to see that a certain proportion of stone-dust was maintained, and, consequently, instead of removing coal-dust stone-dust was constantly added, making travelling on haulage roads not only a nuisance but highly injurious to the health of the workpeople who had to use them; and whether he would request the committee now inquiring into the effects of stone-dust to go down some mine during working hours and whilst the roads were actually being used, so as to enable them to form an intelligent opinion of the magnitude of the evil and the necessity of discontinuing the same.—Mr. SHINWELL replied: I have received some such complaints, though they are rare. I think that my hon. friend has overlooked Section 6 of the General Regulations of July 30th, 1920, which requires that the floor of every travelling road shall be cleared of dust at regular intervals of time. There need be no fear that a committee, which includes Dr. Haldane and Dr. Collis, is without first-hand experience of working conditions underground.

Lead Poisoning in China and Earthenware Trades.

Lord HENRY CAVENDISH-BENTINCK asked the Home Secretary the number of cases of lead poisoning, and the number of fatal cases, in the china and earthenware trades during 1923, and also during January and February, 1924.—Mr. HENDERSON replied: The following are the particulars asked for :—

—	1923.		January and February, 1924.	
	Total No. of cases.	No. of deaths.	Total No. of cases.	No. of deaths.
China and earthenware trades	44	11	8	2
Shipbreaking	38	—	29	1
Electric accumulators	95	2	18	—

THURSDAY, MARCH 20TH.

The House went into Committee of Supply on the

Navy Estimates for 1924–25.

Dr. SPERO said the efficiency of the navy primarily depended upon the health of the Service. From the statement issued by the First Lord of the Admiralty one would imagine that all was well with the Naval Medical Service. He hardly made any reference at all to the Service except to say that the number of medical establishments had been reduced by two—namely, that the Yokohama Hospital was destroyed in the earthquake and the Royal Marine Infirmary was closed down owing to the transfer of the Royal Marine Division. Yet there was a shortage of medical officers in the Service, and at the present moment the Admiralty could not man all the ships with medical officers if they were sent to sea. This was a very serious position which called for immediate inquiry. At the end of January the shortage of medical officers was 39 below the complement required to maintain an efficient service. More men were retiring than entering the Service. The cause of the state of things was that the Admiralty had broken faith with their medical officers. As a result of the new regulations which came into force on Jan. 1st, 1920, medical officers who joined the Service under the distinct understanding that they would be retired at the age of 55, unless previously promoted, were compulsorily retired at the age of 50 without any compensation whatever. Moreover, the retirement was retrospective. The actual monetary loss to each medical officer in five years was £2200. The breach of faith affected junior as well as senior officers. He maintained that it was not from the medical officer's point of view a lucrative Service; in fact, it was a very precarious Service to enter and one that he quite agreed with the British Medical Association was not one which they could recommend young doctors to enter. The British Medical Association repeatedly brought the facts before the Admiralty, but the Admiralty seemed to think that there would be plenty of new candidates forthcoming when the output in the medical schools was at its height. But they had been very much disappointed. He would suggest one or two ways to induce young medical officers just leaving hospital to enter the Service. Remuneration must be the first consideration. A surgeon-lieutenant in the Royal Navy received £438 a year. A lieutenant joining the Royal Army Medical Corps got £555 a year. A married surgeon-lieutenant joining the R.A.M.C. got £617 a year, but a married officer joining the navy got only £438 a year. Perhaps the Admiralty believed in birth control; it looked like it. Again, supposing a medical officer was sent abroad—to China, for example. The Admiralty made no allowance to bring out his wife and family to him. Another reason why medical men would not join the Service was because of the want of opportunities for study. He suggested that the Admiralty should give more frequent opportunities for post-graduate study. There was such a scheme in connexion with the army. In the case of a court-martial the medical officer was the only officer on board who was not allowed to sit on the court even if one of his assistants was up for trial. The Naval Medical Officers' Department was on the top floor of an ordinary block of offices in Victoria-street. The Admiralty had made the medical service a thing apart, and as an old medical officer in the navy he felt that medical men on the whole were not being treated fairly.

Viscount CURZON said that Dr. Spero was perfectly right in saying that the shortage of medical officers in the navy was a very serious problem and it was one to which he (Lord Curzon) would ask the Admiralty to give their serious attention.

Mr. AMMON, Parliamentary Secretary to the Admiralty, replying to the debate, said that he gathered that Dr. Spero had spoken with the support of the medical profession generally as well as that of members of that profession in

the House of Commons. The hon. Member was probably not aware that a deputation from the British Medical Association had been received by the Admiralty on the point and the arguments of his speech were a recapitulation of the points put forward by the deputation. The whole matter was being gone into, and he hoped to reply to the deputation before long. But he ought to say this: The naval pay is £430 a year cash, while the army pay is less. The naval medical officer is also given lodgings and rations.

Lunacy Laws Inquiry.

Mr. ROBERT MORRISON asked the Prime Minister whether, when setting up the proposed body to inquire into the present lunacy laws and their administration, the terms of reference would be made wide enough to include an inquiry into the mental deficiency laws.—Mr. WHEATLEY replied: No, Sir, it is not proposed that the inquiry should extend to the mental deficiency laws. These form a separate and distinct subject-matter, the inclusion of which would, in my opinion, unduly delay the report and recommendations of the inquiry committee upon the more urgent question.

Overcrowded Maternity Wards in Hospitals.

Commander BELLAIRS asked the Minister of Health, in view of the prevalent overcrowding and the resulting increased need of maternity wards at hospitals, what assistance the Government would give in regard to capital expenditure and annual outlay so as to enable welfare centres, borough councils, and hospital committees to prepare schemes at once.—Mr. WHEATLEY replied: I am ready to give sympathetic consideration to proposals for the provision of maternity beds in areas where there is need for additional accommodation, and to pay grants not exceeding 50 per cent. of approved capital and annual maintenance expenditure. The grant in aid of capital expenditure usually takes the form of an annual payment based on the sum required for interest on and repayment of capital within a fixed period.

Medical Women on Lunacy Inquiry.

Mrs. WINTRINGHAM asked the Minister of Health whether, when appointing the committee of inquiry into the lunacy laws, he would include two women, one of the medical profession and one with special and practical knowledge of asylums visiting committees.—Mr. WHEATLEY replied: The hon. Member's suggestion will be carefully considered, but I cannot at present give any undertaking on this point.

Tubercle-infected Milk.

Sir HERBERT NIELD asked the Minister of Health whether he had received a series of resolutions with regard to the inadequate existing legislation with reference to tubercle-infected milk and the Milk and Dairies (Consolidation) Act, 1915; and whether he could see his way to put in operation without further delay the Tuberculosis Order of 1914, and also to introduce legislation to ensure the prevention of tubercle-infected milk being distributed and infected animals being slaughtered.—Mr. WHEATLEY replied: The answer to the first part of the question is "Yes." As regards the second part, I understand that my right hon. friend, the Minister for Agriculture, is considering the question of the reintroduction of the Tuberculosis Order. The hon. Member will be aware that the coming into operation of the Act of 1915 has been postponed by the Milk and Dairies (Amendment) Act of 1922 until Sept. 1st, 1925, and I do not think it will be practicable to introduce other legislation on this subject during the present session.

Dried Milk Regulations.

Mr. GILBERT asked the Minister of Health whether, as the final conference between the Health Department and the representatives of the dried milk trade only took place on Jan. 24th last, and in view of the time required for printing the large stocks of tins, &c., required to comply with the Order, he would postpone the date, May 1st, for the operation of the Public Health (Dried Milk) Regulations to enable the trade to clear the market of outstanding stock and so avoid the unnecessarily heavy loss that would otherwise be incurred.—Mr. WHEATLEY replied: The Public Health (Dried Milk) Regulations were made on Nov. 5th, 1923, to come into operation on May 1st, 1924. The regulations were published in draft on July 24th, 1923, and the representations of the trade were considered, and met, as far as possible, before the regulations were made. I am satisfied that the trade had ample notice of the provisions of the regulations and I see no reason for postponing their operation.

Tubercle-infected Cattle.

Mr. BARNES asked the Minister of Agriculture whether he had received representations from local authorities urging the necessity for legislation to eliminate tubercle-infected cattle from the dairy herds in this country in the interests of public health; and whether he could hold out any promise of early legislation.—Mr. SMITH replied: The answer to the first part is in the affirmative. The matter is being carefully and sympathetically explored, but I am not yet in a position to make any statement on the subject.

MONDAY, MARCH 24TH.

Vaccination Act.

Mr. BLACK asked the Minister of Health the cost of administering the Vaccination Act, 1907, in Great Britain for the last year with respect to the remuneration of vaccination officers; the cost of providing the exemption certificate forms, and any other expenses involved; and how much of the cost fell upon the taxpayer and how much upon the ratepayer.—Mr. WHEATLEY replied: It is not possible to state separately the expenditure incurred on the remuneration of vaccination officers. The total expenditure of boards of guardians on public vaccination for the year ending March 31st, 1922 (the last year for which complete figures are available), was £162,400, the whole of which was defrayed out of local rates. During the same year the sum paid to public vaccinators out of the Exchequer contribution accounts of the local authorities amounted to £10,200, while the approximate cost to the Exchequer of vaccine lymph supplied to public vaccinators and medical officers of health was £11,800. The cost of printing the new form of declaration of conscientious objection has been £67 up to date.

Prison Discipline.

Mr. HAYES asked the Home Secretary whether, in view of the fact that at Parkhurst Prison the medical officers and the registered nurses were experienced in prison discipline, the question would be considered of ceasing to furnish them with truncheons and handcuffs; and why the hospital principal was not relieved by a member of the hospital staff instead of by a discipline principal.—Mr. HENDERSON replied: The hospital officers, like other officers at Parkhurst, carry staves as a part of their ordinary equipment. They have never been used, and the necessity for requiring the officers to wear them when within the hospital is being considered by the Prison Commissioners. Handcuffs are only used for purposes of escort to another prison. The hospital principal officer is relieved by a discipline principal officer pending the transfer of another hospital principal officer from another prison.

Panel Practitioners' Fees.

Sir KINGSLEY WOOD asked the Minister of Health whether he was now in a position to make a statement relating to his proposals concerning the payment of medical men on the panel lists.—Mr. GREENWOOD, Under Secretary to the Ministry of Health, replied: The Government proposals in regard to the matter referred to by the hon. Member are embodied in a Bill which is being introduced to-day.

National Health Insurance Bill.

Later Mr. WHEATLEY introduced the National Health Insurance (Cost of Medical Benefit) Bill, the object of which is "to make further provision with respect to the cost of medical benefit and to the expenses of the administration of benefits under the Acts relating to National Health Insurance, and to amend Section 29 of the National Health Insurance Act, 1918; and for purposes connected therewith." The Bill was read a first time.

Consumption Among Convicts.

Mr. SOMERVILLE HASTINGS asked the Home Secretary whether he could state the percentage of convicts, male and female, who had developed pulmonary consumption during the last five years.—Mr. RHYS DAVIES, Parliamentary Secretary to the Home Office, replied: There were only four cases of pulmonary consumption among male convicts, giving a percentage of 0·16 of the total receptions for the past five years. There were no cases among female convicts.

R.A.M.C. Lieutenants.

Lieut.-Colonel POWNALL asked the Secretary of State for War what was the number of lieutenants in the Royal Army Medical Corps and what was the normal establishment for this rank.—Major ATTLEE replied: The number of lieutenants in the Royal Army Medical Corps is 14, of whom three are seconded. There is no fixed establishment for this rank.

During the debate on the Army Estimates, Lieut.-Colonel POWNALL said that the R.A.M.C. had practically stopped getting fresh recruits of officer rank. The February army list showed seven lieutenants in the whole of the corps, and the majority of these were on probation. In view of the fact that the establishment was some hundreds, there was obviously something very much at fault with the methods of recruiting. He asked the War Office what steps were being taken to secure a reasonable supply of young officers for the corps. The whole health of the army was involved and the question was a most serious one. Unless recruits were forthcoming they would soon find themselves with a corps consisting only of majors and lieut.-colonels.

TUESDAY, MARCH 25TH.

Nil Disability.

Mr. HUTCHISON asked the Minister of Pensions if his attention had been drawn to what was termed "nil disability"; whether he was aware that, when the man's panel doctor certified the man to be suffering from disability, if the medical board decided "nil disability" no right of appeal was allowed against that decision; and would he take steps to allow the right of appeal.—Mr. J. W. MUIR replied: I am not quite clear what class of case the hon. Member has in mind. In cases where the medical board find that there is no appreciable degree of disablement, the award given is one of "nil disablement," and the man concerned has a right of appeal thereon to the assessment appeal tribunal or to a medical appeal board, according as the award is or is not declared a final award. Exceptionally a case has occurred in which the medical board are wholly unable to discover that the claimant has the disability or ailment claimed at all. Where such cases have arisen it has been arranged that the man's appeal should go forward if he desires to appeal. General instructions are being issued.

The Schick Test.

Mr. BROMFIELD asked the Minister of Health what was the composition of the diphtheria toxin which was used for carrying out the Schick test; and how supplies of it were obtained.—Mr. WHEATLEY replied: The test solution in the Schick test for diphtheria consists of a fresh solution of diphtheria toxin which is bacterium-free and is prepared and diluted so that either 0·1 c.cm. or 0·2 c.cm. (as may be decided) represents one-fiftieth of the minimum lethal dose for a 250 g. guinea-pig. Supplies of diphtheria toxin used for this purpose in this country are obtained from the two or three commercial firms which have made special arrangements for its preparation and sale.

Mr. SUNLIGHT asked the Minister of Health whether his attention had been drawn to the recent serious results of inoculating children with toxin-antitoxin in certain educational establishments in two towns in the United States, damages having been recently awarded for the death of a child through inoculation with toxin-antitoxin; and whether, in view of these and other records of disasters in America through the use of the Schick test and subsequent inoculation with toxin-antitoxin, he would dissociate his department from a system which might cause severe injury and even death to those submitted to it.—Mr. WHEATLEY replied: The answer to the first part of the question is in the affirmative, except that I have no information as to any death resulting from the inoculations referred to. I understand that the reactions following the inoculation of these children were due to their receiving a toxin-antitoxin mixture which had been subjected to extreme cold, this causing a dissociation of the mixture. Now that the unfavourable effect of freezing the mixture has been ascertained, suitable precautions will, of course, be taken in future, and I see no reason to modify the advice given in the reports issued by my department on the use of immunisation methods against diphtheria.

Panel Practitioners.

Mr. TURNER asked the Minister of Health if he would state the number of medical practitioners on the National Health Insurance panel in England and Wales; and what was the average number of panel patients to each medical practitioner on the panel in the West Riding of Yorkshire.—Mr. WHEATLEY replied: The average number of insurance practitioners for England and Wales for the year 1923 was approximately 12,850. The average number of panel patients to each insurance practitioner for the West Riding of Yorkshire was for the same year approximately 1100.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

THE ROYAL SOCIETY, Burlington House, Piccadilly, W.

THURSDAY, April 3rd.—4.30 P.M., *Papers to be read:* Sir Charles Sherrington, P.R.S., and E. G. T. Liddell: Reflexes in Response to Stretch (Myotatic Reflexes). H. M. Carleton and G. C. Robson: The Histology and Function of Certain Sex-limited Characters in the Cuttle Fish *Doratosepion confusa*. (Communicated by Sir Charles Sherrington.) *Paper to be read in Title only:* Dr. J. G. Dusser de Barenne: Experimental Researches on Sensory Localisation in the Cerebral Cortex of the Monkey (Macacus). (Communicated by Sir Charles Sherrington.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, March 31st.

Social Evening.

Fellows, Members of Sections, Associates, and their friends, will be received by the President, Sir William Hale-White, and Lady Hale-White, at 8.30 P.M.

Sir John Goodwin (late Director-General A.M.S.) will give, at 9 P.M., a brief discourse entitled "Reminiscences."

Music, light refreshments and smoking.

Tuesday, April 1st.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)

Discussion:

On the Treatment and Functional Results of Tuberculous Disease of the Hip-joint, to be opened by Dr. Gordon Pugh and Mr. T. P. McMurray.

The Discussion will be continued by Mr. Elmslie (President), Sir Henry Gauvain, Mr. Fairbank, Mr. Acton Davis, and others.

Wednesday, April 2nd.

SURGERY: at 5.30 P.M. (Cases at 4.30 P.M.)

Clinical and Pathological Meeting.

Thursday, April 3rd.

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.

Specimens:

Prof. Louise McIlroy: An Apparatus for Measuring the New-born Infant.

Short Communications:

Dr. Gilbert Strachan: Combined Carcinoma and Tuberculosis in the Uterus.

Dr. Everard Williams: A Case of Acute Pemphigus in Mother and Child.

Paper:

Dr. Remington Hobbs: The Causes of Acute Infection of the Uterus, including Puerperal Sepsis and Septic Abortion, and their Treatment by Drainage.

Friday, April 4th.

LARYNGOLOGY: at 5 P.M. (Cases at 4 P.M.)

Cases and Specimens will be shown by Mr. W. M. Mollison, Mr. Jefferson Faulder, Mr. M. Vlasto, Sir James Dundas-Grant, Mr. H. M. Wharry, Mr. F. C. Ormerod, Dr. J. Aldington Gibb, Mr. H. J. Banks-Davis, Mr. J. F. O'Malley, Mr. Norman Patterson, and others.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.

TUESDAY, April 1st.—5 P.M., Dr. Leonard G. Parsons: Wasting Disorders of Early Infancy. (Last Goulstonian Lecture.)

THURSDAY.—5 P.M., Dr. Thomas McCrae: Clinical Features of Foreign Bodies in the Bronchi. (First Lumleian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.

MONDAY, March 31st, to SATURDAY, April 5th.—BETHLEM ROYAL HOSPITAL. Course in Psychological Medicine. Tues., 11 A.M., Dr. Thomas Beaton: The Psychoses. Sat., 11 A.M., Dr. Porter Phillips: The Medico-Legal Aspect of Insanity.—LONDON TEMPERANCE HOSPITAL, in conjunction with BETHLEM ROYAL HOSPITAL, NORTH-WESTERN FEVER HOSPITAL, and the ROYAL WESTMINSTER OPHTHALMIC HOSPITAL. Special Intensive Course (first week).—ROYAL FREE HOSPITAL. Wed., 5.30 P.M., Dr. Heald: Diagnosis and the Selection of Electrical Treatments.—ROYAL WATERLOO HOSPITAL. Lecture Demonstrations, Ward Work, &c. Mon., 2 P.M., Dr. Woodwark; 3 P.M., Dr. Barron. Tues., 2 P.M., Dr. Myers; 4 P.M., Dr. M. Davidson. Wed., 1.30 P.M., Mr. Cairns Forsyth. Thurs., 1.30 P.M., Dr. R. J. Perkins; 2.30 P.M., Mr. Bickerton; 3.30 P.M., Dr. Myers. Fri., 2 P.M., Dr. R. J. Perkins and Dr. Donaldson; 4 P.M., Mr. Beevor. Sat., 9.30 A.M., Mr. Frankau (Operations). Further particulars can be obtained from the office at 1, Wimpole-street, W.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

MONDAY, March 31st.—10 A.M., Surgical Registrar: Surgical Pathology. 12 noon, Mr. Sinclair: Surgical Diseases of the Abdomen. 2 P.M., Mr. Bishop Harman: Eye Department.

TUESDAY.—11 A.M., Dr. McDougal: Electrical Department. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.

WEDNESDAY.—12.15 P.M., Dr. Buruford: Medical Pathology. 2 P.M., Dr. Pernet: Skin Department. 2.30 P.M., Mr. Armour: Surgical Wards.

THURSDAY.—11 A.M., Mr. Simson: Gynæcological Demonstration. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Department.

FRIDAY, 10.30 A.M., Dr. Pritchard: Medical Wards. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Department.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily 10 A.M., to 6 P.M., Saturdays, 10 A.M., to 1 P.M. In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE (Prince of Wales's General Hospital).

At 4.30 P.M.

MONDAY, March 31st.—Mr. Aubrey Goodwin: Vaginal Discharge.

TUESDAY, April 1st.—Mr. C. H. Hayton: Treatment of Atrophic Rhinitis with Ozena (with cases).

WEDNESDAY.—Dr. J. Browning Alexander: Bronchiectasis.

FRIDAY.—Dr. C. E. Sundell: Dyspepsia of Infancy.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.

FRIDAY, April 4th.—4 P.M., Mr. Gill-Carey: Chronic Suppurative Otitis Media.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.

THURSDAY, April 3rd.—4 P.M., Dr. Thompson: Intracranial Tumours.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.

THURSDAY, April 3rd.—5 P.M., Mr. Banister: The Treatment of Contracted Pelvis.

VICTORIA UNIVERSITY OF MANCHESTER MEDICAL SCHOOL.

FRIDAY, April 4th.—5.30 P.M., Dr. G. Northcroft: The Teeth in Relation to Normal and Abnormal Growth.

MANCHESTER CLINICAL SOCIETY.

THURSDAY, April 3rd.—4.30 P.M. (at the University), Dr. Sequeira: Recent Work in Treatment of Disease by Artificial Light.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE LECTURES.

TUESDAY, April 1st.—4.15 P.M., Dr. W. Fletcher Shaw: Leucorrhœa.

Appointments.

FAIRWEATHER, J. W. C., M.B., Ch.B. Edin., has been appointed Medical Officer and Vaccinator for the Parish of Fordoun.

PATTISON, C. LEE, M.B., B.S. Lond., L.R.C.P. Lond., M.R.C.S., Consulting Surgeon to the Tuberculosis Department of the Rotherham Corporation.

Salford Royal Hospital: KNOX, J. F., M.B., Ch.B., B.A.O. Belf., Resident Medical Officer; REID, S. I. H., M.B., Ch.B., B.A.O. Belf., House Physician; TALBOT, G., M.B., Ch.B., B.Sc. Manch., and MCCLURE, C. R., M.R.C.S., L.R.C.P. Lond., House Surgeons: and CRAIG, J. C. B., M.B., Ch.B. Edin., Casualty House Surgeon.

Surgeons under the Factory and Workshop Acts: BRYSON, M., M.B., C.M. Glasg. (Thornhill); SALMON, N. G. H., M.B., B.S. Lond. (Bodmin); BUTLER, T. L., L.R.C.P. Lond., M.R.C.S. (Sherston).

Vacancies.

For further information refer to the advertisement columns.

Birmingham, St. Chad's Hospital.—Res. M.O. £100.
Birmingham Union, Selly Oak Hospital.—Res. Asst. M.O. £300.
British Guiana Diamond Fields.—Government M.O. £500.
Cancer Hospital, Fulham-road, S.W.—H.S. £100.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Hon. Radiographer.
Charing Cross Hospital, W.C.—Med. Reg. and Surg. Reg. Each £150. Also Asst. Surg.
Derbyshire Royal Infirmary, Derby.—H.S., &c. Also Asst. H.S., &c. Each £200.
Dublin University, Trinity College.—Prof. of Pathology. £800.
Evelina Hospital for Children, Southwark, S.E.—H.S. and H.P. Each £160.
Hospital for Consumption and Diseases of the Chest, S.W.—H.P.
Hospital for Sick Children, Great Ormond-street, W.C.—H.S., H.P., and Asst. Cas. O. £50.
Hull City Asylum.—Med. Supt. £1000.
Keighley, Victoria Hospital.—H.S. £180.
Kensington, Fulham, and Chelsea Hospital, Richmond-road, Earl's Court, S.W.—Sen. and Jun. Res. M.O.'s. £100 and £75 respectively.
King's College Hospital, Denmark Hill, S.E.—Jun. P.
Lambeth Parish Hospital.—Jun. A.M.O. £200.
Leeds City.—Chief Clin. Tub. O. £900.
London Jewish Hospital, Stepney Green, E.—Cas. O. £200.
London Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. and Med. Reg. Each 10 guineas.
Manchester Babies' Hospital, Burnage-lane, Levenshulme.—Res. M.O. £125.
Manchester, Baguley Sanatorium.—Third Asst. M.O. £400.
Metropolitan Hospital, Kingsland-road, E.—Sen. H.P., H.S., Jun. H.P., H.S., and Two Cas. O.'s. Each £100. Hon. Anæsthetist.
Norfolk County Council.—Asst. Tub. O. £600.
Norwich, Norfolk and Norwich Hospital.—Cas. O. and H.S. £150.
Oxford, Radcliffe Infirmary and County Hospital.—Hon. Asst. S.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each £150.
Poplar Metropolitan Borough.—Asst. Tub. O. £600.
Prince of Wales's General Hospital, Tottenham, N.—H.S. H.P. Each £150. Jun. H.S. and Jun. H.P. Each £110.
Queen's Hospital for Children, Hackney-road, Bethnal Green, E.—R.M.O. £200.
Rangoon Corporation.—Health Officer. Rs.1200 per month.
St. John's Hospital for Diseases of the Skin, Leicester-square, W.C.—Clin. Assts.
Sheffield Royal Hospital.—Asst. Cas. O. £100.
Somerset Mental Hospital, Wells.—Asst. M.O. £300.
Stafford, Coton Hill Mental Hospital.—Med. Supt. £600.
Surrey County Council.—Asst. M.O.H. £600.
Tunbridge Wells General Hospital.—H.S. £160.
West London Hospital, Hammersmith-road, W.—Hon. Med. Reg.
Western Australia, Medical and Health Dept.—Bacteriologist and Pathologist. £708.
York County Hospital.—H.P. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Milborne Port, Somerset; Northwich, Cheshire; Dronfield, Derbyshire.

Births, Marriages, and Deaths.

BIRTHS.

CLARKE.—On March 19th, at Victoria-square, Clifton, Bristol, the wife of Dr. Richard C. Clarke, of twin daughters.

ELLISON.—On March 25th, at 36, Devonshire-place, W. 1, to Dorothy, wife of John Ellison, a daughter.

HODGSON.—On March 16th, at Andover, the wife of Dr R. G. K. Hodgson, of a son.

OSBORN.—On March 17th, at Sheet-street, Windsor, the wife of Dr. A. G. Osborn, of a daughter.

MARRIAGES.

MORRISON—MARSDEN.—On March 25th, at Sefton Park Presbyterian Church, Liverpool, by the Rev. George H. Morrison, D.D., of Wellington Church, Glasgow, father of the bridegroom, assisted by the Rev. J. Somerled Macdonald, M.A., George Herbert Morrison, M.B., Ch.B., to Helen Mary (May), elder daughter of Mr. and Mrs. J. Wilberforce Marsden, 26, Croxteth-road, Liverpool, and grand-daughter of the late Rev. Henry Marder Douglas, of Kirkcaldy.

DEATHS.

MACEWEN.—On March 22nd, at Woodside-crescent, Glasgow, Sir William Macewen.

REID.—On March 22nd, at St. Augustine's-mansions, S.W., Douglas Arthur Reid, M.D., J.P., in his ninety-first year, assistant surgeon 90th Light Infantry during Crimean War.

RUNDLE.—On March 19th, at Clarence-parade, Southsea, Henry Rundle, F.R.C.S., aged 79.

SYDENHAM.—On March 18th, George Francis Sydenham, F.R.C.S., J.P., of Dulverton, Somerset, aged 63 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

CYTOCLESIS.*

A PHENOMENON EXPLAINING THE COURSE OF EMBRYONAL DEVELOPMENT.

By F. Wood Jones, D.Sc. Lond., M.R.C.S. Eng.,
Professor of Anatomy, University of Adelaide.

It was in 1913, at the International Congress of Medicine held in London, that Ariens Kappers, of Amsterdam, first succeeded in making the bulk of British anatomists appreciate his conception of "neurobiotaxis." That an animal reacts to a sensory stimulus by an appropriate motor response is a phenomenon familiar to everyone. That a newborn animal will do this is common knowledge. Directly the nipple of the mother is near to the newborn pup's nose the sightless senseless creature grasps it with its lips, and the whole complex mechanism of suckling is initiated. The contrivance by which the sensory stimulus of the contact with the nipple produces the appropriate motor response of the movements of the lips and tongue in suckling is laid down in the central nervous system of the pup long before it is born.

The underlying principle of this contrivance was first defined by Ariens Kappers. Suppose that sensory impulses are streaming in, or will one day stream in, from some sense organ to a sensory nerve centre in the brain; in order to fulfil the whole rôle of life, sensation must be acted on and movement must be produced. The sensory nerve centres must, therefore, be related not only in some way to motor nerve centres, but to the *appropriate* motor nerve centres; the embryological bases of the mechanisms of the future in-streaming sensory impulses always "call" to their nerve centres the motor nerve centres which are so linked up with the motor nerves and muscles as to produce the most appropriate reflex response. In the developing brain these things are called together; the living, developing, sensory nerve cells call the living motor nerve cells and hold them by some strange force, remaining in apposition whilst all else around them changes.

Here is something more subtle even than a hormone: a call of cell to cell, a hold of cell on cell; a call exerted long before function demands the harmonious outcome of the call; a call of predestiny; a call of ancestral memory—it matters not what it is termed. In the arrangement of the embryonic sensory and motor ganglia in the brain stem we are dealing with well ascertained facts; no work previous to that of Ariens Kappers and Davidson Black afforded any sort of solution to the problem of the varied arrangement of these ganglia in the different types of animals. Neurobiotaxis is a term applied to the peculiar "call" evinced among the myriad cells which constitute the central nervous system; but the call is not limited to the central nervous system. There is a general phenomenon of cell call, a wonderful influence which living cells exert, and this strange force I shall here name cytoclesis, for which term I am indebted to Prof. Darnley Naylor.

Cytoclesis in the Development of the Eye.

Some of the most beautiful manifestations of cytoclesis are unfolded in the relation of the nervous system to other systems and organs in the body. Take, for example, the eye and its appendages. As the rudiment of the developing eye grows towards the skin there come into being, at the site of its coming, the rudiments of the superficial parts of the organ of vision. From first to last the story of the developing eye moves in a fairyland of insoluble mysteries. First tucked away (and, one would hazard, folded in by an ill-chance) within the dark neural tube, the eye struggles to regain the surface of the head, which one day will be exposed to the rays of light. After its probation period as part of the infolded neural tube, after its painful struggles to be free and to grow towards the surface, where in the distant future it will meet those rays which alone can set its cells vibrating, it still has its trump card to play; it still has its call. Something called it to the surface, and as it approaches the surface its own call goes forth, and the cells of the embryonic skin of the surface of the face respond to the call. The optic cup, growing outwards from the brain, will form the light-sensitive parts of the eye hidden in the layers of the retina; but these parts were useless if the optic cup remains covered by the ordinary opaque skin. It therefore calls to the ectoderm cells of the area towards which it is growing, and a transparent lens and cornea are called into being from cells which elsewhere form the ordinary opaque skin. That the changes which result in the formation of the lens are due to cytoclesis exerted by the optic cup seems beyond question. Should the optic cup fail to develop, or should it fail to grow towards the surface, then the call does not reach the ectoderm of that portion of the face where the transparent media of the eye should be developed, and lens formation does not take place. Moreover, the astonishing work of Lewis (1904) and Sphemann (1912) has shown that if the developing optic cup of a tadpole be removed from its original site and transplanted beneath the embryonic skin of some other part of the body it can still exert its cytoclesis and produce a lens in an altogether abnormal situation. The call is lodged in the cells of the optic cup, and this call may be responded to by the skin of the abdomen if the optic cup be transplanted there. That the embryonic skin of the abdomen should be able to form a lens for a transplanted portion of an eye is a marvel, and only one force, the cytoclesis of the optic cup, can produce the marvel.

Cytoclesis in the Development of the Alimentary System.

Ignoring a host of other instances in which cytoclesis is dramatically displayed in the developing nervous system and its accompanying sense organs, it is well to pass to other systems of the body to see new manifestations of the process. In the developing alimentary system the influence of cytoclesis is seen everywhere. The relation of the stomodeum and the foregut, the call of the liver cells to the vitelline blood, manifest the same phenomenon. But for a grand display we may turn to the developing hind gut and the skin of the perineal region. When the hollow tube, derived from the hypoderm, which constitutes the hind gut or large intestine, grows backwards towards the hind end of the body it exerts its call upon the ectodermal skin of the hind end, and the ectodermal cells start to grow inwards to meet the advancing tube. A skin dimple is thus produced; a skin ingrowth is formed to meet the intestinal downgrowth, a rectum approaches a preformed anus. As the rectum approaches the anal dimple deepens; they are guided towards each other so that they come in contact and only a septum separates them. The septum breaks down, and the alimentary tube opens by an orifice on the surface of the skin. The hypoderm cells of the hind gut have exerted their cytoclesis upon the ectoderm cells of the perineum. But if the rectal downgrowth fails to develop in a normal manner, if that portion which I have termed the "post-allantoic gut" is not perfected, then no call is felt by the ectoderm of the hind end, and the anal dimple fails to develop. Here we almost seem to have a space limit for the action of cytoclesis. A complete failure of the development of the post-allantoic gut results in a complete absence of the call to the ectoderm, and no anal ingrowth is formed. In this way there results the condition of imperforate rectum. But any degree of development of the post-allantoic gut exerts its cytoclesis, feeble or powerful, and some formation of an anal ingrowth takes place. In this way there result the varying degrees of imperforate anus. The cytoclesis of the hypodermic hind gut appears to be exerted on the ectodermic cells of the perineal region only when the hind gut has developed so far as to form a "post-allantoic" portion.

Cytoclesis in the Renal Excretory Apparatus.

I turn now to the manifestation of the cell call in the formation of the renal excretory apparatus. The myriad secreting tubules of the kidney are formed in the hind portion of the great secreting primordium known as the Wolffian body. The myriad minute collecting ducts are formed from an altogether different embryological basis, for they are budded out from the main kidney duct or ureter. Nevertheless, although these two entities are involved in the completion of all the kidney tubules, there is the marvel that results in each secretory tubule in the metanephric portion of the Wolffian body meeting a collecting tubule from the ureter accurately end to end. From the glomerulus, where urine is separated from blood, to the ureter, by which urine is conveyed to the bladder, there is a complete duct; a myriad of such complete ducts. But each duct is composed of two sections, preformed from different embryological elements, but guided to meet each other by a call; each kidney tubule meets each ureteric tubule end to end, and so completes the canal. Here is wholesale cytoclesis: thousands of tubules in each kidney meeting end to end, as the cut ends of thread in two tangled skeins might find each other and join. Again, cytoclesis may fail, and then the myriad secreting tubules of the kidney fail to open into the myriad collecting tubules of the ureter. In this condition the secretory metanephric tubules, having no outlet, dilate with their own secretion into the curious pathological manifestation known as congenital cystic kidney. Congenital cystic kidney is an evidence of the failure of the cytoclesis of the metanephric tubules.

There is no need to multiply instances. Of a certainty cytoclesis is everywhere displayed in the tissues of the animal

* An abstract of part of the commemoration address on "The Position of Anatomy in the Modern Medical Curriculum," delivered in 1923 at the University of Adelaide.

body. Surely it is not too imaginative a thesis to maintain that this ordered call of cell to cell, this prompting as to station, is in reality *the* force which determines that a definite ordered system of organs is created out of a cellular mass. The whole completed perfection of the animal body is in itself evidence of the action of cytoclesis. We are the products of cytoclesis. A community of cells in some way conducts its own destiny, so that by the cytocletic word of command some cells take their station here and some there. An embryo may be said to be a cell community governed and directed by cytoclesis. It is remarkable that long before the microscope was introduced into anatomical studies, and still longer before the cellular nature of tissues was demonstrated, the conception of the animal body as a microcosmos was in general acceptance. In 1651, when Helkiah Crooke wrote his highly instructive work on human anatomy, he entitled it "Microcosmographia: a Description of the Body of Man." So much modern work has progressed upon purely physical or chemical lines of research that we are, maybe, in some danger of regarding the body as a test tube in which chemical reactions occur, or as a thing of which the whole ordered building is a mere matter of simple physical laws.

There are, indeed, some signs and portents that certain of the more subtle chemical explanations of vital phenomena need further examination. The recent work of Cramer seems to indicate that the most elusive of chemical agencies, that of the vitamins, resolves itself into the familiar story of structure and function, rather than one of undefinable chemical action. Deprivation of a vitamin appears to damage a cell complex, and owing to the damage of a series of cells the whole tissues suffer. The ailing of the body in consequence of the damage of a tissue or cell community is a concept different from that of a body suffering from the deprivation of an obscure chemical factor, but altogether in harmony with the picture of the cellular microcosmos ordered by cytocletic action.

Processes of Formation and Repair: A Comparison.

In many ways the formation of parts in the developing embryo is singularly like the process which accompanies the repair of damage inflicted in adult life. The further we go back along the animal scale the more alike the processes become. The power of repair of the human body is limited; we cannot vie with those animals which can renew a limb after its complete loss; nevertheless, the wonders of the possibility of repair in human tissues are manifold. For instance, no surgeon can so accurately oppose the two cut ends of a divided nerve that each regenerating fibre may be opposite its dead and degenerating continuation: and, indeed, one end of the divided nerve may be given a half turn and united thus, and still, when healing is complete, function will be restored. Now, in an ordinary mixed nerve there are sensory fibres and motor fibres, each having its proper connexion in the spinal cord, each having its proper terminal in skin or muscle. It is marvel enough that the down-growing fibres should even find the tubular sheaths of the degenerated portion; it is marvel beyond comprehension that the motor fibres, growing from cells in the anterior horn of the spinal cord, should follow the old sheathing that leads to end-organs in muscles, while the sensory fibres, growing from cells in the posterior root ganglia, find that which leads to the end-organs in the skin. Cytoclesis guides the regenerating fibre along the proper pathway that leads to its appropriate end-organ. And in the repair of bone, or the alteration of bone structure with the development of new strains and stresses, in the processes of healing as displayed in any tissue, everywhere in the details of repair the hand of cytoclesis is to be seen. If cytoclesis be the process which leads to the ordered formation of parts and organs, it surely is the process which leads to their ordered reformation after injury.

If there is a fault to be found with modern medicine, and especially with modern surgery, it might be urged that sufficient regard is not always paid to the wonderful powers of the vis medicatrix naturæ. The more conquests we have, the more successful we become in treating bodily ills, the less we are inclined to ascribe to the vis medicatrix naturæ the cure of our "cases." There is a desire often manifested by the surgeon, and to a lesser degree by the physician, to cure the patient, rather than to put him in the way of deriving the benefit of the cytocletic action of repair. It is a mercy that modern medicine, which has jurisdiction over our methods of repair, has no jurisdiction over our methods of formation. Few surgeons would care to permit the kidney to develop in its extremely risky manner; of a surety they would do an operation to ensure an end-to-end junction of the tubules.

Cytoclesis and Malignancy.

Cytoclesis, we may believe, is the factor of ordered formation and ordered reformation. But perhaps it has another and a more sinister rôle. In many processes of normal embryonic growth there is presented a picture of what may be termed the invasion of one tissue by another. Cytoclesis appears to be able to call from tissue to tissue, so that the cells of one tissue invade an intervening tissue in order to reach their goal. The curious cells of the embryonic trophoblast have one call, one function; through the maternal uterine tissue they seek the blood-vessels from which the embryonic nourishment may be obtained. In the cells of the trophoblast cytoclesis may be said to manifest itself as a blood quest; a blood quest which causes these cells to invade the uterine mucosa in a manner which, without being fanciful, we may describe as hostile. There is something strange in the behaviour of these syncytial cells, something even in their normal behaviour which suggests that type of tissue hostility which we term malignancy. The blood quest of the trophoblast is normally hostile in the maternal tissues; abnormally we know too well it may become in fact malignant, malignant with the terrible malignancy of deciduoma malignum. Again, the growth of the liver cells towards the vitelline blood has much in it to suggest a cytocletic hostility, a call which is answered regardless of intervening tissues. Is it possible that, in the adult, a perversion of cytoclesis or an untimely reawakening of cytoclesis produces the phenomenon of malignancy? Such a conception would seem to fit in with most of the known facts. Give the anatomist cytoclesis and he holds the key of admittance to hospital wards, operating theatre, and clinics. In all these spheres he has a rightful place, and if modern medicine and modern surgery do not admit him to their councils the loss is theirs, or rather that of their patients.

SMOULDERING CLOTHES.

To the Editor of THE LANCET.

SIR,—I had this week the misfortune to be present at a grave burning accident to a girl of 12 years and was greatly impressed by three things: (1) that although flame is easily extinguished by coats and rugs, smouldering is very difficult to extinguish, especially in the less accessible regions; (2) that clothing even under the best circumstances cannot be removed with desirable speed: (3) and last of all, with the great difficulty I had in persuading the bystanders to bring me water for extinguishing purposes. I found the cause for this later in two popular text-books of first-aid where the use of water in extinguishing burning clothing is not mentioned, I presume, because of the mess caused by the carbonised material when wet. Could any of your readers enlighten me as to the reason for this? A horrifying amount of avoidable suffering could be prevented if this superstition were eradicated. I cannot understand what harm can be done by lukewarm water.—I am, Sir, yours faithfully,

March 17th, 1924. "HUMANITY."

ABDOMINAL CONTROL.

A FIRST-CLASS athlete, who, as years advanced, began to run to fat, has written a little book[1] to tell us how he reduced his own weight, and how he does the same for others. Part I. consists of 11 short chapters. The author states his own story, and gives a brief epitome of Sir Arbuthnot Lane's condemnation of the faulty colon. He deals with posture and its value, and with enteroptosis and its disadvantages. In the chapter devoted to flat feet, he says truly enough: "The grace of movement is destroyed, while headache, backache, and general weariness help to complete the misery of the subject." The value of exercise after operation and confinement is well set out. He points out the danger of the muscular wall of the abdomen losing "tone" permanently, and, with true optimism, adds that the "early and judicious employment [of massage] after operation is now a recognised measure all over the civilised world." He says of the time-honoured binder used in post-maternity work, and with much truth: "It certainly gives .... a feeling of comfort .... but, so far as helping to restore the muscles to their normal state, the binder might as well have been tied round the bedstead." The author's views on golf as exercise are interesting. The two chapters on abdominal control are plain common-sense; and when speaking of diet, importance of the fluid intake is emphasised. The chapter which deals with faults of the usual systems of exercise is severe. Doubtless they are true if the "system" is picked up casually or is improperly taught, but the general condemnation is rather too sweeping.

Part II. consists of a description of eight exercises which should be used by the obese for the reduction of weight. These are to some extent familiar. For example, the heels-raising-knee-bending exercise. Others are newer and should be of service. The descriptions are good, and photographs, with the exception of No. 6, the indications of which are not very clear, make it easy to follow the meaning of the text. The book is worthy of attention, and the application of the principles set out ought to meet with success.

[1] The Culture of the Abdomen. By F. A. Hornibrook. London: William Heinemann. 1924. Pp. 67. Illustrated. 6*s*.

MEDICAL RECIPROCITY IN UKRAINE.

To the Editor of THE LANCET.

SIR,—May I ask the hospitality of your columns to invite British medical men who know the Ukrainian language and are interested in the progress of medical and surgical science in the Ukraine to communicate with the Ukrainian Red Cross Society, 150, Southampton-row, London, W.C. 1. It is desired to offer medical journals and other papers for exchange and in other ways to endeavour to maintain contact between the medical faculties of the two countries. Ukrainian doctors would be glad to learn of their British colleagues and may have something of interest to offer in return. I am, Sir, yours faithfully,

March 21st, 1924. ALEXANDRA RACOVSKI.

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AMBULANCE CAMELS.

OVER a century ago the camel was employed by European armies in the East for the transport of casualties, but since then the rôle of that patient beast of burden in military medical history has been somewhat intermittent. Writing in a recent issue of the *Journal of the Royal Army Corps*, Capt. E. B. Marsh records that Napoleon used camels in Egypt for carrying the sick and wounded, who were slung in pairs, one on each side of the camel, in litters devised by Baron Larrey. He reminds us, too, that Surgeon-Major F. H. Brett, surgeon to the Governor-General's bodyguard, recommended, in 1839, such camel transport as "the most comfortable and safe mode of invalid travelling that I have ever heard or read of." But a thoroughly satisfactory litter or "Kajawah" had not been found, so ambulance camels ceased to be employed. There were a few still in Afghanistan in 1879, but in the Malakand in 1897 and in 1905 no mention is made of them. The late war, however, saw camels again mobilised in Egypt, in Mesopotamia, and in East Africa, but they came into their own in Waziristan in 1919–20, when some 90 per cent. of the wounded were thus evacuated. The camel's large, padded feet made it particularly suitable for work in the stony ravines and fords of that area. While it took eight orderlies to carry a man on a stretcher, one orderly could look after four patients on two camels. The kneeling and rising of a camel gives a nasty jerk to his burden, but at large stations, like Jandola, embarking and disembarking platforms were built. One camel will carry from 400 to 600 lb., but he will only march 2½ miles an hour.

A BIBLIOGRAPHY OF EUGENICS.

THE information we possess on the biological evolution of man is so widely scattered that a Bibliography of Eugenics[1] will be welcomed. The net has been cast wide, perhaps too wide, and a good deal of rubbish is sandwiched between contributions of recognised value. Prof. Holmes acknowledges that the literature on this vast subject is very much at loose ends; much of it is uncritical; and comparatively little of it is written with the competence of the highly trained specialist.

The sections into which the mass of inchoate material is divided are as follows: Heredity and Evolution; Eugenics and Works of a General Character; Genealogy; The Problem of Degeneracy; Alleged Increase of Insanity; Notorious Families; The Heredity of Human Traits; Heredity of Human Defect (Inheritance of Feeble-Mindedness, Inheritance of Epilepsy, Inheritance of Insanity, Inheritance of Deafness, the Hereditary Factor in Tuberculosis); Alcohol in Relation to Heredity; Lead Poisoning; Blastophthoria; Racial Influence of Venereal Disease; The Hereditary Factor in Crime; The Hereditary Factor in Delinquency, Prostitution, Pauperism, and Vagrancy (Delinquency, Prostitution, Pauperism and Vagrancy); The Inheritance of Mental Ability; The Alleged Relation of Genius to Insanity and Other Abnormalities; Race; The Birth-rate; Neo-Malthusianism—Birth Control; Natural Selection in Man; Selective Effect of Infant Mortality; Selective Influence of War; Sexual Selection in Man; Urban Selection and the Influence of Industrial Development on Racial Heredity; The Racial Influence of Religion; Immigration and Emigration as Related to Racial Changes; Consanguinity; Race Mixture and the Intermarriage of Different Stocks; Determination of Sex; The Sex Ratio; The Influence of Age of Parents on Offspring; The Influence of Order of Birth on Offspring; Negative Eugenics, Sterilisation, Segregation. These are set out in full in order that those interested in one or other of the subjects listed may realise that this bibliography is comprehensive and is likely to supply the needs of workers in widely separated fields.

[1] By Prof. S. J. Holmes, Professor of Zoology in the University of California. University of California Press. 1924.

THOUGHT-READING MADE EASY.

THE current number of the *Skandinav. Arch. f. Physiologie* (1924, xlv., 74) contains a paper by Jarl Kohler and Curt Roos on an interesting psycho-physiological phenomenon which, as the authors suggest, is being used by professional thought-readers in their performances. As the result of attending such a thought-reading séance in which the thought-reader had to guess a page in a book which a member of the audience—whom we will call the medium—had selected and of which he was thinking, the authors suspected that a slight involuntary change in the respiratory movements betrayed the thoughts of the medium. They therefore carried out the following experiment. A Marey tambour was fixed to a person so that the respiratory movements could be registered on a drum behind a screen. The person, who was not aware of the object of the tambour, was then asked to think of a figure between 1 and 100 and to concentrate his mind on it. The "thought-reader" then began to count slowly aloud beginning with 1. As soon as he reached the figure of which the "medium" was thinking the "medium" made a number of deep inspirations, which are clearly shown in the records accompanying the paper. Of 12 persons who served as a medium only one was a failure. One made such a deep inspiration when the number was reached that the membrane covering the tambour burst.

THE HEALING ART AMONG THE ANCIENTS.

THAT the practice of medicine and surgery reached a relatively high state of development in ancient Egypt we have abundant proof, both in the records left by the Egyptians themselves and in the references made to Egyptian skill in healing by the later Greek and Roman historians and poets. When the Greeks penetrated to Egypt in the seventh century B.C., Egyptian medicine had probably passed its zenith which some archæologists date as early as 2000 B.C. The history of ancient Egyptian surgery forms the subject of an interesting article by Mr. H. B. Roderick in the Lent number of the *Cambridge University Medical Society Magazine*, where the author gives several quotations from the well-known "Ebers Papyrus," the most ancient complete book in existence, which is held to belong to the fifteenth century B.C., and from which most of our knowledge of ancient medical lore is derived. The papyrus begins with a number of incantations against disease and then proceeds to enumerate a large number of diseases in detail with about 700 different remedies for the same. Thus a favourite Egyptian pomade for baldness consisted of equal parts of the fat of the lion, hippopotamus, crocodile, goose, serpent, and ibex. Another consisted of equal parts of writing ink and cerebro-spinal fluid. A large proportion of the diseases known to modern medical science are carefully classified and their symptoms minutely described. Here we find some approach to the accurate clinical pictures of Hippocrates, and many have supposed on this slender evidence that the Father of Medicine was indebted to Egypt for much of his knowledge. Mr. Roderick does not hold this view, for Greek medicine and particularly surgery even at the time of the Trojan War, was entirely free from priestly domination, whereas later Egyptian medicine was certainly in the hands of the priests. As it is known that the Egyptians practised embalming from about 2500 B.C., it can be inferred that this process necessitated some knowledge of anatomy, and although this was rudimentary in character, records show that the Egyptians reached a degree of knowledge and skill in surgery well in advance of that reached by any of their contemporaries. Their teaching was, however, essentially non-progressive in character, and this characteristic is also seen in the Assyrian medical texts, so faithfully compiled[1] by Mr. R. Campbell Thompson, found in the royal library of Ashurbanipal which belong to a much later date. At the time of Galen Egyptian medical writings had fallen into disrepute, but it can be said that Egypt at least exercised a powerful influence through the channels of Judah and Greece on the development of mankind.

[1] THE LANCET, March 22nd, 1924, p. 601.

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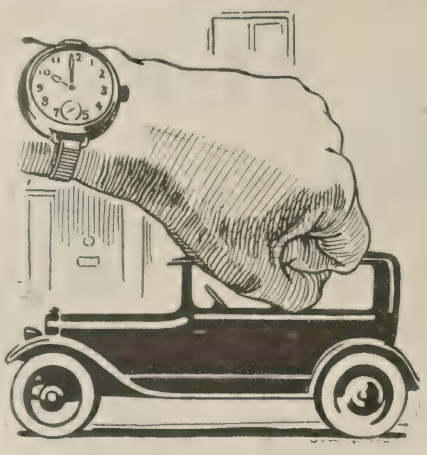

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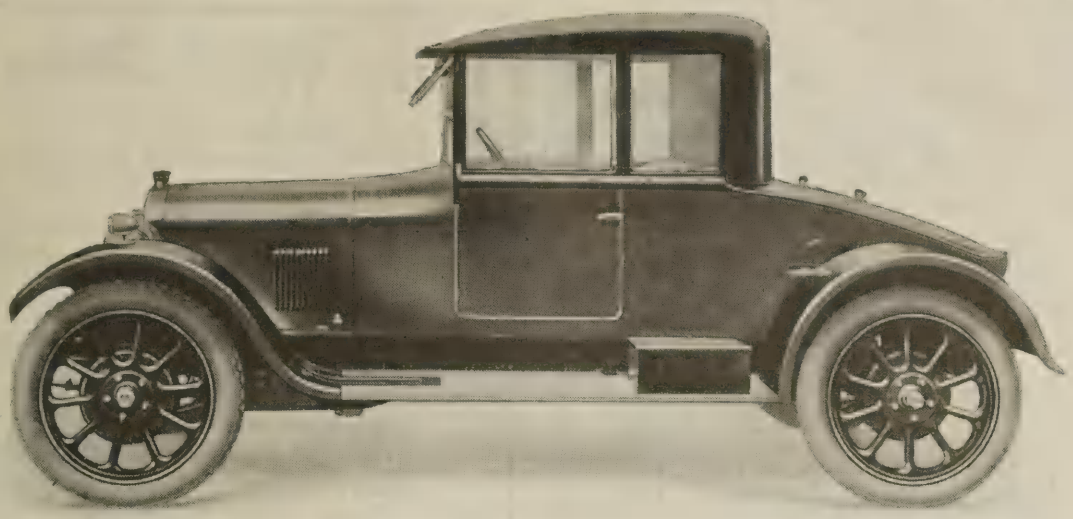

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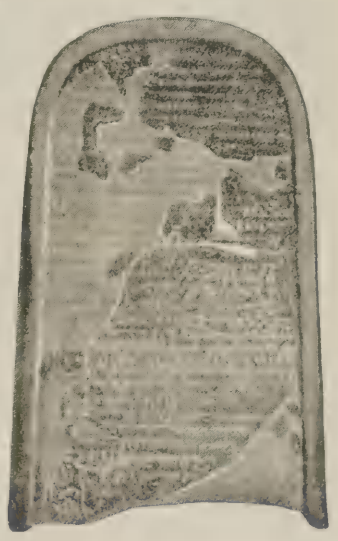

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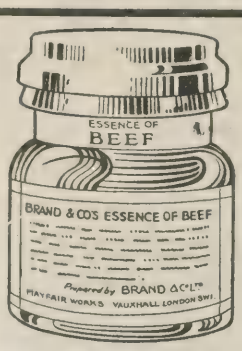

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The ANNUAL MEETING of the MEMBERS of the ROYAL MEDICAL BENEVOLENT FUND will be held at 5.30 P.M. on TUESDAY, APRIL 15th, 1924, at 11, Chandos-street, Cavendish-square, London, W. 1, when the Annual Report and Financial Statement for the year ending December 31st, 1923, will be presented, and the Officers and Committee for the current year will be elected.

G. NEWTON PITT, Hon. Secretary.
GEORGE BETHELL, Assistant Secretary.

March, 1924.

Royal College of Physicians.

DR. THOMAS MCCRAE will deliver the LUMLEIAN LECTURES on APRIL 3rd, 8th, and 10th, at 5 o'clock at the College, Pall Mall East, S.W.

Subject: "THE CLINICAL FEATURES OF FOREIGN BODIES IN THE BRONCHI."

Any member of the Medical Profession admitted on presentation of card. By order of the President.

H. M. BARLOW, Bedell and Secretary.

Liverpool School of Tropical Medicine.

Courses of Instruction (lasting three months) for the Diploma and also in Veterinary Parasitology, commence about September 15th and January 7th. Prospectus from the Hon. Dean, School of Tropical Medicine, University of Liverpool.

Seamen's Hospital Society.

LONDON SCHOOL OF TROPICAL MEDICINE

ENDSLEIGH GARDENS, N.W.1.

Sessions will commence 22nd April and 22nd Sept., 1924, respectively.

For prospectus and further particulars apply to the Secretary, London School of Tropical Medicine, Endsleigh Gardens, N.W., or to the Head Office, Seamen's Hospital, Greenwich, London, S.E.

UNIVERSITY EXAMINATION POSTAL INSTITUTION.

Postal or Oral Preparation for all Medical Examinations.
(Forty years' experience in postal tuition.)

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M.D.(Lond.), 1901-23 (8 Gold Medallists 1913-21) **271**
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M.B., B.S.(Lond.), *Final*, 1906-23 (completed exam.) **154**
F.R.C.S.(Eng.), 1906-23, Primary **112**; Final **79**
F.R.C.S.(Edin.), 1918-23 ..... **21**
M.R.C.P.(Lond.), 1914-24..... **75**
D.P.H. (various), 1906-23 (completed exam.) ... **216**
M.R.C.S., L.R.C.P. *Final*, 1910-24 (completed exam.) **214**
M.D. (Durham) (Practitioners), 1906-23 **32**
M.D. (various), by Thesis. Many Successes.

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Mr. D. L. EADIE,
49, Lauriston Place, EDINBURGH;
or to **Mr. WALTER HURST,**
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NORTHERN BRANCH. — Apply, LADY SUPERINTENDENT, 57, Clarendon Road, Leeds. Telephone: Leeds 26165.

Telephone: LANGHAM 2728
Telegrams: "ASSISTIAMO, LONDON"

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Male or Female.

Our nurses are chosen carefully for their personal character and their suitability for private work. They reside on the premises, and are available for urgent cases Day or Night.

(Mrs.) MILLICENT HICKS, *Superintendent.*
W. J. HICKS, *Secretary.*

THE NURSES' ASSOCIATION

In conjunction with the MALE NURSES' ASSN.

29, YORK ST., BAKER ST., LONDON, W.1.

YARROW CONVALESCENT HOME, BROADSTAIRS

FOR CHILDREN OF WELL-EDUCATED PEOPLE OF VERY LIMITED MEANS.

CHARGE, 10s. PER WEEK FOR EACH CHILD.

This fee is subject to addition or deduction according to Parents' means.

100 Beds. **Boys, ages 4 to 12.** **Girls, ages 4 to 14.**

The usual stay is **4 weeks**, but some wards are reserved for serious cases requiring special treatment, and for these a lengthened stay may, under some circumstances, be granted, and the age limit raised to 14 for Boys and 16 for Girls.

The Home faces the sea, and is open all the year, being as well adapted for winter, as for summer residence.

Particulars can be obtained from the Secretary, YARROW CONVALESCENT HOME, 116, Victoria St., Westminster, London, S.W.1.

THE DEESIDE SANATORIA IN SCOTLAND

FOR THE OPEN-AIR TREATMENT OF

PULMONARY TUBERCULOSIS and ALLIED DISEASES

At BANCHORY and MURTLE.

Medical Director - - DAVID LAWSON, M.A., M.D., F.R.S.E.

These Sanatoria are situated amidst **Ideal Surroundings in Middle Deeside,** the reputation of whose **Climate** in the treatment of Lung Diseases is well established.

Both Institutions are well equipped with **Research Laboratory, Throat Room, Dental facilities,** and powerful **X-Ray Plant. Full Day and Night Nursing Staffs** are employed.

Special Treatment by artificial **Pneumothorax** (with X-ray Control), the various **Tuberculins,** and Autogenous **Vaccines,** &c., is available without extra charge.

NORDRACH-ON-DEE

At BANCHORY, near BALMORAL.

Physician - - - - DR. IAN STRUTHERS STEWART.
Assistant Physician - DR. J. C. LORRAINE.

For particulars apply Secretary.

TOR-NA-DEE SANATORIUM

At MURTLE, ABERDEENSHIRE.

Senior Physician - - DR. J. M. JOHNSTON.
Assistant Physicians - DR. JAMES LAWSON & DR. A. C. FOWLER.

Inclusive terms 7 guineas a week.

For further particulars apply Secretary.

The Scottish Branch of the British Red Cross Society is prepared to contribute towards payment of the fees of ex-Officers and Nurses recommended by the Society, and such Officers and Nurses obtain priority of admission to TOR-NA-DEE.

VALE OF CLWYD SANATORIUM.

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and of the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level, on the south-west slopes of mountains rising to over 1800 feet, which protect it from the north and east winds and provide many miles of graduated walks with magnificent views.

Trained Nursing Staff day and night. X-Ray apparatus. Treatment by Artificial Pneumothorax in suitable cases.

Electric lighting in every room. Heating by radiators. For particulars apply to Medical Superintendent, H. MORRISTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall, Ruthin, N. Wales

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THE GRAMPIAN SANATORIUM.

Situated in the Upper Speyside district of Inverness-shire. One of the highest inhabited districts in Britain—"The Switzerland of the British Isles." Bracing and dry mountain climate, well sheltered. Sanatorium specially built for the Open-Air Treatment of Tuberculosis. Open in 1901. Elevation nearly 900 ft. above sea-level. Electric light throughout buildings and in rest shelters. FULLY EQUIPPED X-RAY PLANT. All forms of Treatment available, including facilities for Treatment by artificial Pneumothorax. **A few rooms are now reserved for surgical cases not requiring immediate operation.** Terms: 4 to 6 guineas weekly.—*For Particulars apply:* **FELIX SAVY, M.B., Ch.B., Physician-Supt.**

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[Telephone: 16 Rickmansworth.
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For the treatment of Gentlemen under the Act and privately. Established 1883 by an association of prominent medical men and others for the study of inebriety; profits, if any, are expended on the institution. Large secluded grounds on the banks of the river Colne. All kinds of out-door and in-door recreations and pursuits.—For particulars apply to F. S. D. HOGG, M.R.C.S., &c., Resident Medical Superintendent.

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Ladies and Gentlemen received.

Small, select home, standing in 3½ acres of secluded gardens overlooking Torbay, near Torquay. Billiards, golf, tennis, &c. Every case treated with a view to rapid & permanent cure. Consultations at No. 1, Harley St. London, W. by appointment.

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Accommodation is provided for the reception of PRIVATE PATIENTS of both sexes in three detached Villas, which are healthily and pleasantly situated in extensive grounds, with sea views. Charges from 3 guineas weekly, including all necessaries, except clothing. Apply to the Medical Superintendent.

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A PRIVATE HOME for the treatment of Ladies and Gentlemen suffering from Mental and Nervous Affections. Highly situated, facing Finsbury Park.

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The Grove, Old Catton, Norwich.—

A High-class Home for the Curative Treatment of Nervous Affections. Voluntary Boarders are also received without certificates.

For full particulars apply to the Misses MCLINTOCK, or to Dr. S. BARTON, 34, Surrey-st., Norwich, Visiting Physician.

City of London Mental Hospital,
Dartford, Kent. Under the Management of a Committee of the Corporation of the City of London.

PRIVATE PATIENTS are received at a weekly charge of TWO GUINEAS and upwards.

Apply to the Medical Superintendent.

Bucks Mental Hospital,
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The Visiting Committee of this Hospital can receive PRIVATE PATIENTS at a minimum weekly charge of 1½ guineas. Apply to the Medical Superintendent.

Guest House for Children,

10, Surrey-road, Cliftonville, Margate.—DELICATE CHILDREN received and trained. Governess and Trained Nurse. Highest Doctors' references.—Mrs. BEATRICE BROWN.

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charming Country HOUSE, beautiful garden, South aspect close to sea, where Invalids are received for Rest, Care, or Convalescence. Accommodation for Spinal Cases. Excellent cooking. Moderate charges.—Apply, Miss Gertrude Fletcher, R.R.C.

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STRETTON, SHROPSHIRE.

A PRIVATE HOME for the Care and Treatment of a limited number of Ladies Mentally Afflicted.

Climate healthy and bracing.

Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

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CASES are received from 5 guineas weekly in Doctor's Country Home. Golf, tennis, &c. Own poultry, fruit and vegetables. Tel. 194 Chertsey.

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Woman Doctor with special experience receives Two or Three Children into her charming home in healthy Country Town; sunny garden. Educational facilities. — Address, No. 437, THE LANCET Office, 423, Strand, W.C. 2.

Home for Infants and Children of

gentle birth for long or short periods. Trained nurses. Every care. Moderate terms. References required.—Apply, Matron, Bonaker's Children's Home, 52, Croydon-rd., Beckenham.

London Temperance Hospital,

Hampstead-road, N.W. 1.

Applications are invited for the post of SURGICAL REGISTRAR. Honorarium 40 guineas per annum. The appointment is for a period of one year, and applications, with testimonials, should be forwarded to the Secretary not later than April 4th.

London Temperance Hospital,

Hampstead-road, N.W. 1.

Applications are invited for the post of MEDICAL REGISTRAR. Honorarium 40 guineas per annum. The appointment is for a period of one year, and applications, with testimonials, should be forwarded to the Secretary not later than April 4th.

King's College Hospital. — The

Committee of Management invite applications for the post of JUNIOR PHYSICIAN, who shall hold the post of Medical Tutor and Morbid Anatomist. In the event of the appointment of the present Medical Registrar, who is a candidate, the Medical Registrarship will be vacant. Applications, together with copies of three testimonials, should be sent before April 1st, 1924, to the House Governor, King's College Hospital, Denmark Hill, S.E. 5, from whom particulars of the duties can be obtained.

Metropolitan Hospital, Kingsland-

road, E. 8.—The General Committee are prepared to receive applications for the appointment of an HONORARY ANÆSTHETIST (Male).

Candidates, who must be Medical Practitioners registered in this Country, will be required to call upon members of the Staff.

Applications, with copies of three recent testimonials, must reach the Secretary at the Hospital not later than first post on Wednesday, the 23rd April, 1924.

Central London Throat, Nose, and

EAR HOSPITAL, Gray's Inn-road, W.C. 1.

HONORARY RADIOGRAPHER.

The Committee of Management invite applications for the post of Honorary Medical Officer to take charge of the X ray Department about to be constructed. Times of attendance to be arranged.

Applications should reach the undersigned not later than April 3rd. RICHARD KERSHAW, Secretary.

Paddington Green Children's Hospital,

London W. 2.—HOUSE PHYSICIAN, HOUSE SURGEON.—These appointments will become vacant on May 1st, 1924. Gentlemen are invited to send in their applications, with copies of three testimonials, addressed to the undersigned not later than April 10th, 1924. Salary of each £150 per annum, with board and residence. Candidates who have held a responsible Resident Hospital appointment are preferred. The appointments are for a period of six months.

JAMES A. HAMLIN, Secretary.

London Jewish Hospital,

Stepney Green, E. 1.

Applications, stating in full previous appointments held, are invited for the post of CASUALTY OFFICER, and should be sent to the Secretary immediately, accompanied by copies of three recent testimonials. Salary at the rate of £200 per annum, with lunch and tea. The holder will be required to attend the Out-patient Department daily (Monday to Friday) at 9 A.M. Applicants must possess a registered qualification.

The Cancer Hospital (Free),

(Incorporated under Royal Charter),
Fulham-road, London, S.W. 3.

The Committee are prepared to receive applications for the post of HOUSE SURGEON. Salary £100 per annum. The appointment is for six months and subject to rules, a copy of which may be obtained from the Secretary.

Previous experience as a House Surgeon is indispensable.

Applications, with three copies only of testimonials, to be sent to the undersigned not later than the first post on Tuesday, 8th April, 1924. J. COURTNEY BUCHANAN, Secretary.

Metropolitan Borough of Poplar.

Applications are invited from registered Medical Practitioners for appointment as

ASSISTANT TUBERCULOSIS OFFICER

to act under the Tuberculosis Officer and the Medical Officer of Health. Salary £600 per annum, subject to contribution to the Council's Superannuation Scheme.

Applications, stating age and experience, accompanied by copies of not more than three recent testimonials, to be delivered to the undersigned not later than 12 noon on Friday, the 4th April.

C. H. SHILLINGLAW, Town Clerk.

Council Offices, High-street, Poplar, E. 14.
22nd March, 1924.

Parish of Lambeth.

BOARD OF GUARDIANS.

Wanted, a Male JUNIOR ASSISTANT MEDICAL OFFICER for the LAMBETH PARISH HOSPITAL (including lying-in wards, and for the out-relief districts of the Parish administered therefrom). Applicants must be fully qualified and have recently held a Resident appointment at a recognised Teaching School. The work is arranged so that a wide experience may be obtained by the officer appointed.

Remuneration at the rate of £200 per annum, with full residential allowance.

Written applications to be sent to the Clerk to the Guardians, Guardians' Offices, Brook-street, Kennington, S.E. 11, not later than Wednesday, 16th April, 1924.

Evelina Hospital for Children, South-

wark, S.E.—The Committee of Management requires a HOUSE SURGEON (Male) for four months, and HOUSE PHYSICIAN (Male) for six months, both from 12th April. Salaries at £160 per annum, with board, residence, and washing. Candidates should send applications, stating age and qualifications (with dates), together with copies of four testimonials, to the Secretary at Hospital before 4th April.

Suitable applicants (qualified and registered) will be informed when they must be interviewed by the Medical Committee.

Selected candidates must attend Committee of Management.

Time and place of meeting will be notified by the undersigned, from whom rules and other particulars relating to the post may be obtained. By order of Committee of Management.

3rd March, 1924. H. C. STANILAND SMITH, Secretary.

The Hospital for Sick Children,

Great Ormond-street, London, W.C. 1.

The following appointments will shortly be vacant:—

HOUSE SURGEON, 12th April, 1924.
HOUSE PHYSICIAN and ASSISTANT CASUALTY OFFICER, 14th April, 1924.

Gentlemen are invited to send in their applications, addressed to the Secretary, before 12 o'clock on Monday, 31st March, 1924, with copies of not more than three testimonials given specially for the purpose, and also evidence of their having held a responsible Hospital appointment.

The appointments are made for six months. Salary £50, laundry allowance £2 10s., and board and residence in the Hospital.

Candidates must be unmarried and possess a legal qualification to practise.

All candidates must appear before the Joint Committee at their meeting on Wednesday, 2nd April, 1924, at 5 P.M. precisely.

Forms of application and copies of the rules may be obtained from the Secretary.

By order of the Board of Management.

March, 1924. JAMES MCKAY, Secretary.

MEDICAL REGISTRAR.

The Council invite applications for the post of Medical Registrar. Honorarium £150 per annum. A copy of the Regulations can be obtained from the undersigned, to whom applications, together with copies of three testimonials, must be submitted not later than Monday, April 7th, 1924.

PHILIP INMAN, House Governor.
Charing Cross Hospital, London, W.C. 2.

SURGICAL REGISTRAR.

The Council invite applications for the post of Surgical Registrar. Honorarium £150 per annum.

A copy of the regulations can be obtained from the undersigned, to whom applications, together with copies of three testimonials must be submitted not later than Monday, April 7th, 1924.

PHILIP INMAN, House Governor.
Charing Cross Hospital, London, W.C. 2.

ASSISTANT SURGEON.

The Council invite applications for the post of Assistant Surgeon to the Charing Cross Hospital. Candidates who must be Fellows of the Royal College of Surgeons of England, should send in their applications, together with copies of three testimonials, to the undersigned, not later than Monday, April 7th, 1924.

PHILIP INMAN, House Governor.
Charing Cross Hospital, London, W.C. 2.

Hospital for Consumption and DISEASES OF THE CHEST, Brompton, S.W.—The Committee of Management invite applications for the post of HOUSE PHYSICIAN. The duties include work in the Out-patient Department as well as in the Wards. Applications, with testimonials, must be sent in not later than Wednesday, 16th April, 1924, addressed to the Secretary. The appointment is for six months, commencing on 1st May, with an honorarium of £50.

March, 1924. FREDERICK WOOD, Secretary.

The Queen's Hospital for Children, Hackney-road, Bethnal Green, E. 2. — RESIDENT MEDICAL OFFICER required. The appointment is made for twelve months, and may be extended to a further period of twelve months. Salary £200 per annum, with board, residence, and laundry.

The Resident Medical Staff consists of the R.M.O. (post now advertised), two House Physicians, and three House Surgeons. Candidates must have held a responsible Resident appointment at a recognised Hospital. Applications, with copies of not more than three testimonials, given specially for the purpose, should reach the Secretary not later than 7th April.

T. GLENTON KERR, Secretary.
17th March, 1924. Telephone: Dalston 305 and 534.

The Prince of Wales's General HOSPITAL, Tottenham, N. 15.

Applications are invited for the following posts, vacant on the 15th April next:—

HOUSE SURGEON.	£150 per annum.
HOUSE PHYSICIAN.	£150 per annum.
JUNIOR HOUSE SURGEON.	£110 per annum.
JUNIOR HOUSE PHYSICIAN.	£110 per annum.

With residence, board, and laundry.

The appointments are held for six months, but the holders are eligible for re-appointment for a further term.

Candidates (Male) must be duly qualified and registered, and applications, together with copies of three recent testimonials, to be sent to me on or before Monday, 31st March, next.

FREDK. W. DREWETT, Director.
March 10th, 1924.

West London Hospital, Hammer- smith-road, W. 6.—Applications are invited for the post of HONORARY MEDICAL REGISTRAR for a period of one year, eligible for re-election annually. The holder of the post must hold no appointment at a general teaching hospital during his term of office. The duties include the preparation of the Medical Registrar's Report for the year and the supervision of the records of cases. The candidate appointed must be available as substitute for the Physicians and Assistant Physicians when required, and be prepared to undertake such teaching for the Post-Graduate College as may be desired.

Candidates are required to be registered under the Medical Act, to send applications so as to reach me not later than Wednesday, 23rd April next, to attend the Medical Council meeting on Friday, 25th April, at 4.30 P.M., and prior to that date to call upon and send copies of application and testimonials to each member thereof; to abstain from canvassing, but nevertheless to send copies of application and testimonials to each member of the Board of Management, at whose meeting on Tuesday, 29th April, at 5 P.M., candidates must be in attendance.

H. A. MADGE, Secretary.

Clinical Assistants required.— Vacancies will shortly occur for Clinical Assistants at ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Leicester-square, W.C. 2. For further particulars apply to the Secretary.

Kensington, Fulham, and Chelsea HOSPITAL, Richmond-road, Earl's Court, S.W. 5.—Applications are invited for the posts of SENIOR and JUNIOR RESIDENT MEDICAL OFFICERS (Males). The appointments are for twelve months and six months respectively, from July 1st, 1924.

Salaries £100 Senior, and £75 Junior.

Applications, stating age, with copies of three recent testimonials, should be sent to the undersigned on or before April 18th, 1924. FREDERICK J. JONES, Secretary.

Radcliffe Infirmary and County HOSPITAL, Oxford.—Applications are invited for the post of HONORARY ASSISTANT SURGEON at the above Hospital.

Applications, together with twenty copies of three testimonials, to be forwarded to the undersigned not later than Monday, 7th April, 1924. A. G. E. SANCTUARY, Administrator.

Coton Hill Mental Hospital, Stafford. The Visiting Committee invite applications for the post of Male MEDICAL SUPERINTENDENT of the above Hospital.

Salary £600 per annum, with board, furnished quarters in the Hospital, and laundry.

Candidates must be fully qualified Medical Practitioners and have had experience in Mental Hospitals. Diploma in Psychological Medicine an advantage.

Applications, together with copies of not more than three testimonials, to be sent to the Chairman of the Committee not later than Saturday, April 12th.

Coton Hill, 24th March, 1924

Birmingham Union.

SELLY OAK HOSPITAL.

RESIDENT ASSISTANT MEDICAL OFFICER (JUNIOR).

Applications are invited from fully qualified Medical Practitioners (accustomed to administering anæsthetics) for the above post.

The present Hospital accommodation is approximately 450 Beds (Medical, Surgical, and Maternity and Gynæcological).

The appointment will be for a period of twelve months in the first instance but may be extended at the end of that time.

The person appointed to the post will be required, should occasion arise, to assist at any of the other Institutions under the control of the Guardians.

Commencing salary £300 per annum, rising by annual increments of £25 to a maximum of £400 per annum, together with full residential emoluments (rations, laundry, and attendance).

Further particulars of the appointment may be obtained from the Medical Superintendent, Dr. W. Martin.

Applications, stating age, experience, and qualifications, accompanied by copies of recent testimonials, should be forwarded to me at the earliest possible date.

JAMES CURTIS, Clerk to the Guardians.
Union Offices, Edmund-street, Birmingham,
22nd March, 1924.

The Corporation of Rangoon invite applications for post of HEALTH OFFICER. Salary Rs.1200/- per month, rising by annual increase of Rs.60/- per month to Rs.1500/- per month, plus motor-car allowance of Rs.150/- monthly. Engagement on agreement for five years with extension by consent to ten years. First year will be period on probation, during which, or at the end of which, engagement terminable by either party with three months' notice. Free first-class passage and half-pay during voyage out will be allowed. Successful candidate will be eligible to join Corporation of Rangoon Provident Fund paying subscriptions at the rate of 8¼ per cent. of salary, Corporation of Rangoon contributing equal amounts, compound interest allowed according to amount earned by fund. Leave and leave allowances in accordance with special leave rules in fundamental rules of the Government of India. The Officer appointed will be responsible for administration of the department associated with Public Health, including Veterinary and removal and disposal of rubbish and refuse from City, and will be Adviser to the Corporation of Rangoon on all matters pertaining to Public Health, including preparation and carrying out of schemes for prevention of and control of epidemics and other diseases. Population of City 342,000. Candidates must be registered under Medical Acts as holders of Diploma in Public Health, and should state age, education, and other qualifications, experience acquired, accompanied by copies of testimonials. Successful candidate if passed medically fit will be required to join appointment immediately.

Applications should be addressed to the undersigned not later than 9th May.

All applications will be sent to Rangoon where the selection will be made.

OGILVY, GILLANDERS & CO., Reference R.2278,
Sun Court, 67, Cornhill, London, E.C. 3.
London Agents for the Corporation of Rangoon.

The Sheffield Royal Hospital.—

Applications are invited for the post of ASSISTANT CASUALTY OFFICER. Salary £100 per annum, with board and residence in the Hospital. Candidates must be registered Medical Practitioners and unmarried.

Applications, with copy testimonials, to be sent to me as early as possible.

JOE W. ROBINSON, Secretary.

The Board Room, 14th March, 1924.

Victoria Hospital, Keighley.

(100 Beds.)

HOUSE SURGEON required. Appointment for six months, renewable for a further period of six months. Salary at the rate of £180 per annum, with board, residence, and laundry.

Candidates, who must be fully qualified and registered, should send applications, with copies of recent testimonials, to the undersigned on or before the 29th March, 1924.

M. HOYLE, Secretary.

The Mental Hospital, Wells, Somerset.

ASSISTANT MEDICAL OFFICER required (Male), single. Must be legally qualified and registered. Previous experience not essential. A knowledge of Bacteriology a recommendation. Salary commencing £300 per annum, with board, lodging, washing, and attendance, subject to statutory deductions for Superannuation Fund. Applications to be sent to Medical Superintendent, stating age, and with full particulars, and not more than three recent testimonials.

Derbyshire Royal Infirmary, Derby.

(General Hospital. 318 Beds.)

Applications are invited for the following Resident appointments, which will become vacant on 1st May :—

HOUSE SURGEON, Gynæcology and General Surgery.

ASSISTANT HOUSE SURGEON and CASUALTY OFFICER.

The appointments are for six months, and may be extended. Salary £200 per annum, with apartments, board, &c.

Candidates (Male) must be qualified and registered. Applications, with copies of three recent testimonials, to be sent to the undersigned not later than first post on Thursday, 10th April.

WALTER BANKS, Superintendent and Secretary.

28th March, 1924.

Norfolk County Council.

APPOINTMENT OF ASSISTANT TUBERCULOSIS OFFICER.

Applications for the above post are invited. Special experience in the diagnosis and treatment of Tuberculosis is essential. The Officer appointed will work under the direction and supervision of the County Tuberculosis Officer, and will be required to reside in Norwich.

The duties consist of visiting patients at their homes, dispensary and such other work as may from time to time be required. Travelling expenses are provided and the officer is supplied with a car. Some experience of Laboratory work would be appreciated. Salary £600 per annum.

Applications, accompanied by not more than three recent testimonials, stating age and date when free to commence duties, must be received by Dr. W. B. Christopherson, County Tuberculosis Officer, Bank-court, The Walk, Norwich, not later than Saturday, April 5th, 1924.

H. C. DAVIES, Clerk of the Council.

Shirehouse, Norwich, 18th March, 1924.

City of Leeds.

CHIEF CLINICAL TUBERCULOSIS OFFICER.

Applications are invited from qualified and registered Medical Practitioners for the post of Chief Clinical Tuberculosis Officer. The person selected will have the status of Assistant Medical Officer of Health, and will be required to devote his whole time to the office. It will be necessary for him to enter into an agreement of service with the Corporation, terminable by three months' notice on either side, and to undergo a medical examination and contribute to the Superannuation Fund established under the Local Government and Other Officers' Superannuation Act, 1922.

Applicants should be under forty-five years of age, must have had experience in the treatment and care (dispensary and sanatorium) of persons suffering from Tuberculosis, had experience of Medical and Surgical practice in a General Hospital and be acquainted with modern methods of diagnosis and treatment, including X Ray, Tuberculin, Pneumothorax, &c.

The possession of a D.P.H. is not essential, though it would be considered an extra qualification.

Salary £900 per annum. Statement of duties and form of application can be obtained from the Medical Officer of Health, 12, Market Buildings, Vicar-lane, Leeds.

Applications, together with copies of three recent testimonials, endorsed "Tuberculosis Officer," must be delivered at my office, 26, Great George-street, not later than 5th April.

Canvassing any member of the Council directly or indirectly is prohibited

March 1924. ROBERT E. FOX Town Clerk.

County Hospital, York. (170 Beds.)—

HOUSE PHYSICIAN wanted. Candidates must be fully qualified and registered. Salary £150 a year, with board, residence, &c. Applications, stating age, together with copies of not more than three recent testimonials, to be sent to the undersigned not later than the 3rd April next.

FREDK. NEDEN, Secretary.

Manchester Babies' Hospital, Burnage-lane, Levenshulme.—

Applications are invited for the post of RESIDENT MEDICAL OFFICER. The appointment is for six months. Salary at the rate of £125 per annum, with laundry. Only candidates with previous Hospital experience need apply. Applications to be made by April 7th to

ANGELA LOPEZ, Secretary.

Norfolk and Norwich Hospital,

Norwich.—CASUALTY OFFICER and HOUSE SURGEON (with charge of 40 Beds) required. Salary £150, with board, residence, and laundry.

Candidates (Male), who must possess registered qualifications, should forward applications, stating age, nationality, &c., together with copies of testimonials, to the undersigned as soon as possible.

March 28th, 1924. FRANK INCH, Secretary.

Tunbridge Wells General Hospital.—

Wanted, HOUSE SURGEON. Candidates must be unmarried and duly qualified in Medicine and Surgery. (Two residents.) May be required to lecture to Nursing Staff. 86 Beds. In-patients 1923, 1304. Surgical cases largely predominate. Major operations 700 yearly. V.D. Clinic.

Salary £160 per annum, with board, residence, &c., in the Hospital.

This Hospital is approved by the University of London for the purpose of the M.D. and M.S. Examinations.

Applications, stating qualifications, with certificates of registration and copies of testimonials, should be sent to the undersigned on or before Wednesday, April 9th next. Appointment to be entered into May 1st.

J. J. WEBB, Secretary.

Hull City Asylum.

APPOINTMENT OF MEDICAL SUPERINTENDENT.

Applications are invited for the appointment of Medical Superintendent at the above Asylum. The salary offered is £1000 per annum (no bonus to be paid thereon), with emoluments, valued now for pension purposes at £250 per annum, and subject to revision, as follows: residence (furnished), coal, light, vegetables for self, wife, and family, laundry, permission to buy provisions, &c., out of store at contract price, and £30 per annum towards upkeep of motor-car.

The Asylum is situate at Willerby, seven miles from Hull.

Forms of application can be obtained from the undersigned.

Applicants, in addition to completing the form, will be required to send in a formal application for the post.

Applications, endorsed "Medical Superintendent," should be sent to or delivered at my office not later than Thursday, the 10th day of April, 1924.

The appointment will be subject to the provisions of the Asylums Officers' Superannuation Act, 1909.

Canvassing, either directly or indirectly, will be a disqualification.

H. A. LEAROYD,

Town Clerk, and Clerk to the Committee of Visitors.

Guildhall, Hull, 18th March, 1924.

Surrey County Council.

ASSISTANT MEDICAL OFFICER IN PUBLIC HEALTH DEPARTMENT.

Applications are invited for the appointment of a Male Assistant Medical Officer. Candidates must possess a qualification in Public Health, and have had experience in the diagnosis and treatment of Tuberculosis and Venereal Diseases. The Officer appointed will be required to undertake such other public health duties as may be allocated to him. He will be on the Staff of the County Medical Officer of Health, must reside in the County, and devote the whole of his time to the work. Salary £600 per annum, rising by annual increments of £20 to £700 per annum.

The appointment will be subject to the approval of the Ministry of Health, to the provisions of the Local Government and other Officers' Superannuation Act, 1922, and to the Standing Orders of the Council, which provide inter alia that the appointment may be determined at any time by three months' written notice.

Applications, stating age, qualifications, and experience, together with copies of three recent testimonials, should be made on the prescribed form and sent to the County Medical Officer of Health, 5, Grove-crescent, Kingston-upon-Thames, from whom copies of the application form may be obtained, and to whom any inquiries relating to the appointment should be addressed.

Last day for receipt of applications: 2nd April, 1924.

Canvassing directly or indirectly will disqualify.

T. W. WEEDING, Clerk to the County Council.

County Hall, Kingston-upon-Thames, 17th March, 1924.

City of Manchester.

BAGULEY SANATORIUM. (333 Beds.)

THIRD ASSISTANT MEDICAL OFFICER.

The Public Health Committee invite applications from qualified Medical Men for the position of Third Assistant Medical Officer in the above Institution.

Every applicant must be a registered Medical Practitioner, under forty years of age, and unmarried.

Preference will be given to applicants with previous Hospital experience. A knowledge in Bacteriological methods is desirable.

Salary £400 per annum, which includes emoluments (board, lodgings, and laundry) valued at £91 13s. per annum, with bonus in addition, which at present amounts to £83 8s. per annum. The commencing cash remuneration is therefore £391 15s.

Every application, stating fully the training, qualifications, and experience of the candidate and his age, with copies of three recent testimonials, and endorsed on the envelope "Medical Officer, Baguley Sanatorium," must be addressed to the Medical Officer of Health, Civic Buildings, 1, Mount-street, Manchester, only, and not to members of the Committee or Council, not later than Saturday, the 12th April, 1924.

The gentleman appointed will be required to contribute to the Corporation Superannuation Fund and to execute the deed of service. Canvassing in any form, oral or written, direct or indirect, is prohibited. P. M. HEATH, Town Clerk.

Town Hall, Manchester, 24th March, 1924.

St. Chad's Hospital, Birmingham.

FOR PAYING PATIENTS. 100 Beds.

RESIDENT MEDICAL OFFICER required (Male or Female). This post offers exceptional educational advantages. The Medical Staff consists of thirty Consulting Specialists in all branches of Medicine. Salary £100 per annum, with furnished apartments, board (excepting stimulants), and laundry.

Candidates must be fully qualified and registered, and have previously held Resident post.

Applications (marked R.M.O.), with full particulars of experience, age, &c., together with copies of recent testimonials, should be sent to the undersigned not later than April 10th, 1924.

DAVID J. RICHARDS, House Governor.

University of Dublin.

TRINITY COLLEGE.

On May 21st, 1924, the Council will proceed to nominate a Whole-time PROFESSOR OF PATHOLOGY, who will be Director of the Departments of Pathology and Bacteriology, to take up his work on October 1st, 1924. Fixed salary £800 a year, plus certain fees. His tenure will be for five years and he will be eligible for re-election. Candidates should send twenty-five copies of not more than five testimonials so that they reach the Dean of the School of Physic, Trinity College, Dublin on or before 1st May, 1924. For further information apply to the Dean of the School of Physic as above.

Western Australia.—Applications are

invited by the Agent-General for Western Australia from duly qualified Medical Men for the position of BACTERIOLOGIST and PATHOLOGIST, Medical and Health Department of Western Australia. Applicants must be fully qualified Practitioners, experienced in and competent to carry out the routine work of a Laboratory, performing all branches of Clinical and Public Health, Bacteriology and Pathology. Commencing salary £708 per annum, rising to £804. Salary to commence from date of arrival in Western Australia. Transport allowance of £200 for married man and £100 for single man. Should the successful applicant voluntarily relinquish the position before the expiration of two years from the date of his appointment, he will be called upon to refund the amount of the transport allowance. Applications, which should be endorsed "Pathologist," must reach the Agent-General for Western Australia, Savoy House, 115–116, Strand, London, W.C. 2, not later than the 12th April, 1924.

Colonial Service. — Government

MEDICAL OFFICER required for service in the BRITISH GUIANA DIAMOND FIELDS. Salary £500, with station allowance £200, private practice computed at £250, and free transport and quarters. Appointment for three years, renewable and with option of being made pensionable from beginning if service satisfactory. £40 each way provided for passages. Candidate should be bachelor, aged between twenty-five and thirty-three. Further information may be obtained from the Assistant Private Secretary (Appointments), Colonial Office, Downing-street.

Qualified Medical Man required for

position in the Straits Settlements. Young unmarried Man preferred. Three years' agreement. Good salary; passage paid out and home. Free unfurnished quarters. Write, with particulars, giving age, experience, and copies of testimonials, to Box 988, Leathwait and Simmons, 34, Throgmorton-street, E.C. 2.

Indian Medical Service.

The Secretary of State for India announces that vacancies in the Indian Medical Service continue to be filled by direct appointment.

For EUROPEAN OFFICERS of British nationality to be appointed in the immediate future, special terms are offered, including gratuities of £1000 after five years' service, together with free return passages for those who no longer desire to remain in the service.

Candidates must be under thirty-two years of age at the time of application, and must possess qualifications registrable in Great Britain and Ireland under the Medical Acts now in force.

Further particulars can be obtained on application to the Secretary, Military Department, India Office, Whitehall, London, S.W. 1. Letters should be marked "Recruitment for I.M.S."

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Hospital post, reading for M.R.C.P., three previous resident posts, also one and a half years G. P. London references, wishes Evening work; accept hospitality. Prefers Central London.—"H." 19, Clifton Villas, Warwick-avenue.

Required by a Belgian Physician on

British Medical Register, ASSISTANTSHIP to ophthalmic Surgeon.—Apply, F. D. R., c/o Parke, Davis and Co., 50–54, Beak-street, W. 1.

Gentleman gives Lessons on his

two private Cars; also evenings and Sundays. Excellent testimonials. Terms very moderate.—Ring 4288 Mayfair. Capt. Nash, 16A, Allsop-place, Baker-street Station.

Medical Men, possessing their own

Bacteriological and Pathological Laboratories, can obtain trained, efficient, and experienced Women Laboratory Assistants who are also legally qualified Dispensers. Preparation for Examinations.—Apply, London College of Pharmacy, 7, Westbourne Park-road, W. 2.

Wanted by a firm of Metallic Institu-

tion Bedstead Manufacturers, an Agent on Commission, who calls upon hospitals, workhouses of the United Kingdom.—Address, No. 459, THE LANCET Office, 423, Strand, London, W.C. 2.

Expert Radiographer and Clinical

PHOTOGRAPHER now at liberty. Six years' Hospital experience. Accustomed secretarial work. Excellent testimonials.—Address, No. 454, THE LANCET Office, 423, Strand, W.C. 2.

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Wanted, Partnership or Practice with efficient introduction on South Coast, good class, small or no panel. A good house and garden are desirable. Income £1000 per annum or over. Funds available. Replies will be treated as confidential.—Address, No. 432, THE LANCET Office, 423, Strand, W.C. 2.

Wanted, good General Practice in or near London or large Provincial Town. Receipts over £1000 a year. House with garden desired.—Send full details to No. 464, THE LANCET Office, 423, Strand, W.C. 2.

Wanted, Country or Country Town PRACTICE or PARTNERSHIP, yielding £1000 a year or more. House to be rented. Necessary capital available.—Apply, Peacock & Hadley, 19, Craven-street, Strand, W.C. 2. (No charge unless sale effected.)

Required at once, Practices and PARTNERSHIPS.—Mr. W. S. Atkins (late of Arnold & Sons, London) has a large number of Clients who are seeking Practices and Partnerships, and wish to settle down at once.—Send full particulars, in confidence, to Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

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For Disposal.—A really good Practice is not always to be had directly, but Mr. PERCIVAL TURNER (with forty years' personal experience) can generally offer applicants something suitable on being furnished with details of their requirements. Nearly all the best practices are sold by him without being advertised.—Full information free of charge on application, personally or by letter, to 4, Adam-street, Adelphi, Strand, W.C.2.

Brighton.—Great Bargain.—Large NURSING HOME on Marine Parade; 33 rooms, all with sea view. Suitable for Private Hotel or Medical Institution. Electric light and passenger lift. If sold immediately low price of £5000 accepted, freehold. Occupied; immediate possession would be given.—Marine Mansion, Box No. 451, THE LANCET Office, 423, Strand, W.C. 2.

For Sale, old-established Practice in West London district. Satisfactory Partnership introduction.—Address, No. 462, THE LANCET Office, 423, Strand, W.C. 2.

Manchester City.—Old-established Middle- and Working-class PRACTICE For Sale. Average cash receipts £1400. Panel 900. Premium, one and a quarter years' purchase. Excellent house, garage, &c., for sale with practice.—Address, Manchester Medical Agency, 24, London-road, Manchester.

South-East Coast Town.—Good sound PRACTICE for Sale. Easily worked. Ample scope. Receipts over £2000. Panel over 1500. £50 per annum appointment. House, in good position, for sale or rented at £60 per annum. Introduction if desired. Premium £3000.—Address, No. 463, THE LANCET Office, 423, Strand, W.C. 2.

Within 20 Miles of London.—Old-established PRACTICE for Disposal. About £850 per annum. Panel 750–800. Visiting fees 3s. 6d. to 10s. 6d. Cons. 3s. 6d. No Midwifery but ample scope. Good house to rent, 3 reception, surgery, &c., 5 bedrooms, good garden.—Apply, No. 7576, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

To Purchasers.—Do not buy any Practice or Partnership without an investigation into books and other inquiries by an expert specially competent to conduct the same. Forty years' personal attention to such inquiries has given Mr. PERCIVAL TURNER an unique ability to advise in all cases. Terms and full particulars free on application to 4, Adam-street, Adelphi, Strand, W.C. 2. Telephone: 399 Gerrard. Telegrams: Epsomian, London.

Laboratory, well fitted, close to Harley-street. Terms £50 yearly. Doctor's house. Part-time use of Consulting-room could be arranged if required.—Address, No. 460, THE LANCET Office, 423, Strand, W.C. 2.

Service Flat, Doctor's house, adjoining Harley-street. Terms from 4 guineas weekly; or BED-SITTING ROOM, 2 guineas weekly. Meals extra. Whole- or part-time use of Consulting-room available.—Address, No. 461, THE LANCET Office, 423, Strand, W.C. 2.

Large Consulting Room
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To LET,
Furnished with Light, Heat, and Attendance.
£250 per year or near offer.
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Golders Green Road.—Ideal Medical Man's Corner HOUSE. Garage space. Four beds, two reception, lounge hall. Adjoins new shopping centre. Close New Brent Station.—Write, 47, Adelaide-road, N.W. 3.

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1. LONDON.—Riverside Suburb. Old-established good-class non-dispensing PRACTICE. Steady average income of over £1800. Fees 5s. to 1 guinea. About 12 cases of Midwifery a year at 5 to 10 guineas. Excellent detached house, with good garden; rent £130. Lease 21 years. Very efficient introduction to suit purchaser's wishes. Premium £3000.

2. ESSEX.—Market Town, within 20 miles of London. Old-established General PRACTICE, comprising all classes of patients, and held by the Vendor many years. Steady average income of about £1375. No appointments. Panel of 500. Advice and medicine 3s. 6d.; visits 5s., 10s., to £1 1s. About 20 Midwifery cases a year at 4 to 8 guineas. Very convenient corner house with large garden; rent £156. Premium £2000, payable part by arrangement.

3. WEST LONDON.—Old-established Mixed General PRACTICE. Income for the last year, approximately, £3000, including panel of 2000. Advice and medicine 2s. upwards; visits 3s. 6d., 5s. About 6 Midwifery cases a year at from 2 to 10 guineas. Ten-roomed house, with small garden, on lease; rent £100. Partnership introduction for 12 months or longer if desired. Premium £4000.

4. CANADIAN COAST TOWN.—Old-established Middle-class PRACTICE, held by Vendor 30 years. Income for the last 12 months £1650; average for the last ten years £1350. No appointments. Nearest opposition 10 miles. Fees: Consultations 1 dollar, medicine 1 dollar extra; visits 2 to 8 dollars. Not much Midwifery, fees 15 to 35 dollars. House is Vendor's own property, and contains 2 reception-rooms, professional rooms, 5 bedrooms, bathroom, &c.; central heating, electric light, &c.; small garden. Trout and salmon fishing, shooting. Premium for house and practice £3500, payable £2000 cash and a mortgage for the balance on the house.

5. DERBYSHIRE.—Hospital Town. Old-established PRACTICE, held 13 years by present Incumbent, who is relinquishing on account of ill-health. Cash receipts for the past 3 years average £3000 per annum, including about £1500 from panel. Fees 3s. 6d. to £1 1s. About 50 cases of Midwifery a year at 2 to 5 guineas. Centrally situated house (2 reception-rooms, consulting- and waiting-rooms, 4 bedrooms, bathroom, &c.) on lease at £100 a year. Premium 1½ years' purchase. Good scope for surgery, and Vendor is on the Staff of the Hospital.

6. NORFOLK.—Unopposed Country PRACTICE. Very old-established, and situated in a very pretty part of the County. Practice is for immediate Disposal owing to the ill-health of the Vendor. Receipts for the past three years average £1500 per annum, including appointments and panel of about 1000. Very little Midwifery. Good house with ample accommodation, small garden; rent £54. Premium to prompt purchaser £1450. Sport of all kinds; tennis club, &c. Efficient introduction given.

7. KENT.—Large Town (within 50 miles of London).—PARTNERSHIP.—A Half Share in an old-established Practice producing an average of over £3800. No panel and no appointments. Surgery fees 2s. and 2s. 6d.; visits 3s. and 3s. 6d.; very little Midwifery, 2½ guineas. Night work extremely light. House on lease, with 2 reception-rooms, 6 bedrooms, bathroom, &c., small garden; rent £60. Premium 1½ years, payable chiefly by instalments.

8. SOUTH-WEST OF ENGLAND.—Large Town. Very sound Middle- and Working-class PRACTICE, held nearly 25 years by present Incumbent, who is relinquishing on account of ill-health. Average cash receipts over £1200 a year, including several small appointments and a panel of over 1300. Visits 3s. 6d. to 10s. 6d. Midwifery from £3 3s.; about 30 cases yearly. Very good house, specially built for a Doctor, contains 2 reception-rooms, waiting-room, consulting-room, surgery with separate entrance, 5 bedrooms, &c.; garden. Premium £1800.

9. PARTNERSHIP.—A Third Share is offered in an old-established General Practice, situated in a Residential Suburb of South-East London. Income for the immediate past year, approximately £2200. Practice offers large scope with the aid of a suitable Partner. No appointments. Panel of 700. Fees from 3s. 6d. upwards. A few Midwifery cases from £3 3s.; choice of houses or suitable rooms can be secured. Premium 2 years' purchase. Cambridge Graduate preferred.

10. PARTNERSHIP.—Kent.—A Half Share of an old-established first-class, unopposed Country Practice, amidst pretty surroundings. Worth about £1600 per annum, including panel about £450 and union and vaccination appointment £50. A number of country houses, farmers, shopkeepers, &c. Suitable arrangements can be made as regards a house. Sport of all kinds, cricket, tennis, &c., hunting. Premium for share 2 years' purchase. Excellent scope.

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See also p. 25.