THE
BRITISH MEDICAL ASSOCIATION
MEETING AT SWANSEA.

THE SECTIONS.

MEDICINE.

FRIDAY, JULY 31ST.

Dr. R. J. M. BUCHANAN (Liverpool) opened the discussion on

Susceptibility and Infection.

After tendering his apologies for any shortcomings in his remarks on account of the shortness of the notice received he said that he would approach the subject mainly from its clinical and practical aspect. He considered natural resistance and its opposite susceptibility to infection to be distinct potential and vital phenomena. Immunity might be defined as resistance to a disease and there was a difference between immunity to the bacilli and to their toxins, just as there were pure bacterial infections and bacterio-toxic infections, though no hard-and-fast line could be drawn between them. The phagocytic theory of Metchnikoff and its readjustment to more recent theories were discussed. Reference was made to the action of leucæmic blood on bacteria. In natural resistance the alexins were to be regarded as protective agents by virtue of the dissolution of organised foreign substances which they normally effected, whether they were foreign red blood corpuscles or bacteria. Increase of resistance, general or local, mainly depended upon hyper-leucocytosis and methods of increasing natural resistance by production of hyper-leucocytosis were referred to. The natural resistance against toxins was regarded as a means by which the alexins and phagocytic cells were enabled to act protectively. In reference to acquired susceptibility Dr. Buchanan emphasised the importance in medical practice of recognising the part played by such adverse conditions as starvation and bad diet, exposure to heat, cold, and moisture, fatigue, and diseased conditions as general interferences with resistance. The importance of recognising the rôle of mixed infections was discussed, with special reference to pulmonary tuberculosis. Professor Welch's hypothesis of reciprocal infection provided material for much serious thought. Recognising in cultures of pathogenic bacteria intracellular and extracellular poisonous substances Dr. Buchanan asked—Were the bacteria while manufacturing these toxins living under conditions normal to them? Did the culture media contain the very substances which provoke the bacteria to form such toxins and immunising bodies? Had they any certain proof that bacteria living in conditions natural to them produced any such toxins at all? The possibility of reciprocal infection between different species of bacteria was pointed out. Assuming the possibility that under conditions natural to them bacteria did not produce poisons, Dr. Buchanan suggested that in a case where an animal was naturally immune to a specific bacterial invasion there would be nothing in its tissues or body fluids which affected the bacteria in any way. On the other hand, should any alteration of these tissues and fluids have taken place before invasion, conditions arose which acted upon the bacteria to make them offensive factors—in fact, the determination of the disease was dependent not upon the invasion of the bacteria alone but upon the action upon them of the tissues and fluids of a body antecedently deranged. Or both host and bacteria might be in an abnormal state prior to their meeting. When the question as to how bacteria brought about disturbances of the body metabolism was considered it should also be remembered that bacteria did not always effect this change and that disturbances of metabolism had probably existed previously and might have been a causal agent. The immunising power of human milk was referred to and it was suggested that the susceptibility to tubercle in hand-fed infants might thus be accounted for, the cow being a susceptible animal. In conclusion, Dr. Buchanan discussed the question of racial and individual resistance and susceptibility relative to inheritance.

Dr. A. MCPHEDRAN (Toronto) took exception to the statement that the natural resistance varied with the natural vigour of the individual. Were not strong, vigorous young men very prone to contract enteric fever? He would also like

to ask Dr. Buchanan how the well-known efficacy of the inoculation of erysipelatos streptococci as a treatment for malignant disease was to be explained.

Dr. D. O. McVAIL (Glasgow) referred to patients apparently in the highest bodily vigour attacked with tuberculosis and other diseases. Might it not be a chemical change which constituted susceptibility as in the culture media used in the laboratory? A closer study of the culture bases on which bacteria thrive might in the future elucidate this problem.

Dr. G. PARKER (Bristol) communicated

A Case of Bronzed Diabetes.

The patient, a man, aged 65 years, suffered from diabetes for five months before his death from coma. During life definite greyish-brown pigmentation was noticed on his face, trunk, and limbs, but not on the mucous membranes. The urine did not average more than 50 ounces daily and before the onset of coma it contained no acetone or diacetic acid, but about 5½ per cent. of sugar. At the post-mortem examination besides pigmentation of the skin and muscles there was very marked hypertrophic cirrhosis of the liver and to some extent of the pancreas and spleen. All these organs, as well as the lymphatic glands, were so infiltrated by a pigment containing iron that they were of a deep brown colour, changing to a brilliant blue after treatment with hydrochloric acid and ferrocyanide of potassium. Sections showing these changes were exhibited in the room and the liver and pancreas were placed in the museum. The intestines after removal quickly turned to a dusky metallic grey. This disease was at first thought by Hanot, Marie, and others to be a complication of diabetes, but the view was gaining ground that it was a form of toxic cirrhosis in which hæmoglobin was changed to hæmosiderin and retained in the body, while diabetes came on in a proportion of the cases either from irritation of the suprarenals or from cirrhosis of the pancreas.

Dr. McVAIL read a paper on

The Treatment of Uræmia by Spinal Puncture.

Edema in acute renal affections developed suddenly and was universal and the connective tissue in the brain was involved in the general edema. There was thus produced a condition of increased intracranial over-pressure, as the cranium was an undilatable chamber. Convulsions and coma occurring in connexion with albuminuria had very generally been regarded as the effects of uræmic poisoning, but Dr. McVail had for some years been in doubt as to the truth of this poisoning theory. In his view they were due to the increased intracranial pressure and if the symptoms of convulsions and coma in renal disease were due to intracranial pressure that pressure would obviously be lessened by puncture and drainage of the spinal arachnoid space. In 1900 and again in the present year of 1903 he had had the opportunity of practically determining this question. In the first of these years a patient with acute albuminuria and edema, after severe intracranial pain followed by convulsive attacks repeated during 30 hours, had become almost blind, and notwithstanding free perspiration by hot-air baths and pilocarpine he became comatose. The operation of spinal puncture was performed at Dr. McVail's request by Dr. D. N. Knox. The spinal fluid fell in drops from the cannula for three-quarters of an hour and then the cannula was withdrawn. In all about six drachms of fluid escaped, the patient being entirely unconscious and no anæsthetic being required. Within four hours the patient began to regain consciousness and his sight commenced to return. He slept a natural sleep during the night and awoke in the morning entirely free from pain or mental dullness or confusion and with perfect vision. No more fits occurred. The urine rapidly increased in amount, the albumin rapidly diminished, the edema disappeared, and he left the hospital some weeks afterwards with only a trace of albumin present in the urine. The second case was that of a man in whom albuminuria had quickly developed with moderate edema of the surface. In a few days he had become mentally confused and he was still mentally confused when he was taken to the Royal Infirmary, Glasgow. His urine contained a large amount of albumin. Hot-air baths and pilocarpine produced free perspiration, but without benefit to his cerebral state, and 36 hours after admission the comatose condition was deep. Dr. J. Patrick performed spinal puncture and fully an ounce of fluid escaped. Again, as in the first case, at the end of

about four hours consciousness began to return and he made a good recovery. The result of the spinal puncture in these two cases proved, in Dr. McVail's opinion, that the pain, the convulsions, and the coma of acute albuminuria were due in many, if not in all, instances to the sudden increase of intracranial pressure and not to uræmic poisoning of the nerve centres. They further proved that this increased intracranial pressure might, in at least some instances, be effectually relieved by spinal puncture.

Dr. T. N. KELYNACK (London) and Mr. SYDNEY R. WILLIAMS (Bristol) communicated a paper on

The Comparative Value of Oral and Rectal Temperatures in the Study of Pulmonary Tuberculosis.

The conclusions arrived at were based upon 17,420 observations in 300 different cases, in all stages and of every variety of tuberculous disease of the lungs. It was shown that in a healthy adult during rest the rectal temperature was normally a little less than 1° F. higher than the oral, but after exercise the rectal temperature was raised from two to three degrees. After a man had played an hour at lawn tennis, for instance, the rectal temperature would rise from 99° to 101·4°, though in the same circumstances the oral temperature had only risen from 98·4° to 98·6°. These normal or physiological variations in the temperature in the rectum deserve careful attention. In 38 per cent. of the patients examined the rectal temperature bore no constant relation to the oral. In 11·3 per cent. the rectal reading maintained a more regular range than the oral. In 1·3 per cent. of the cases the rectal temperature was constantly from one to two degrees above the oral record. Generally speaking, the discrepancies between oral and rectal temperature had been most apparent in patients with a comparatively slight degree of pyrexia, while they had more closely corresponded when a conspicuous and persistent degree of pyrexia existed. The results of the investigation seemed to warrant the following conclusions. 1. The temperature taken in the mouth during rest formed a trustworthy guide in the management of tuberculous cases under conditions of sanatorium life. 2. The temperature taken in the month during, or shortly after, exercise could not be considered trustworthy unless accompanied by such precautions as militated against their general practical applicability. 3. The temperature taken in the rectum during rest generally speaking registered higher than in the mouth but did not otherwise usually afford any special assistance in the management of tuberculous cases. 4. The temperature taken in the rectum during, or shortly after, exercise in both healthy and tuberculous subjects registered a temperature considerably higher than that in the mouth, and whilst in the non-tuberculous the return to normal was more rapid than in the tuberculous no special advantage for the latter appeared to accrue from this method.

Dr. CHOWRY MUTHU (Wells) read a paper on

The Treatment of Pulmonary Tuberculosis by Formaldehyde.

The methods by which he had administered the drug were: (1) by an inhaler, using a mixture of 40 per cent. formalin, one part; chloroform, one part; rectified spirit, two parts, with a few drops of liquor ammoniæ to neutralise the pungency; (2) by vaporisation; (3) by intravenous injection as suggested by Dr. Robert Maguire; and (4) by electricity, using Francisque Lôtte's method of transfusing formaldehyde by static currents of electricity. The first and second of these methods were advocated as shortening the duration of the treatment. As to the third and fourth methods it would, Dr. Muthu said, be premature to speak of any positive and definite results at present as the trials had not yet been sufficiently extended.

Dr. BUCHANAN remarked that before coming to a conclusion as to the value of formaldehyde he would like to compare cases which had been treated solely by this reagent with others treated in other ways.

SUBSECTION OF ELECTRO-THERAPEUTICS.

WEDNESDAY, JULY 29TH.

Dr. H. LEWIS JONES (London), the President of the subsection, opened a discussion on

The Treatment of Malignant Diseases by Electrical Methods.

He said: It gives me great pleasure to open the proceedings of this subsection because I am sure we all feel that the occasion is one of note in the history of medical electricity in this country. The establishment of a subsection for electro-therapeutics under the auspices of the British Medical

Association marks a stage in the advance of the subject in public interest and is a source of gratification, I feel sure, to all who have the interest of medical electricity at heart and to all those whose patient work for years past has helped to lay a firm foundation for the superstructure of the future. I trust that this gathering may be the first of a long unbroken succession of meetings at which the inevitable advances of the science of electricity with their equally inevitable applications to medical science may be described and criticised, to receive judgment in accordance with their deserts. The subject which is down for our consideration is one of the highest importance. All over the civilised world just now men's minds are being turned with fresh energy towards the object of finding some means which can be used to check the advances of that group of disease which we know as malignant disease. There is a feeling that in some way or other a cure might be found in spite of all failures of the past. In particular the newer discoveries of science are being examined by medical men and when any fresh fact seems to offer a clue the path which it indicates is being followed up minutely. Medical men have always shown themselves ready to make a practical application of the discoveries of science. Take, for instance, the applications of the x rays. The progress in this section has been almost purely a medical matter. It is the medical profession which has provided the stimulus for the elaboration of x-ray machinery and methods and has accounted for the astonishing development of Professor Roentgen's discovery. So, too, with the alternating current supplied in towns for electric lighting. No sooner was this type of current-supply available than its therapeutic possibilities were being examined and applied by medical men, with the result that it is now a thoroughly recognised method of medical treatment and is filling its own proper corner in the field of electro-therapeutics; so also with the high-frequency group of phenomena, the phenomena of condenser discharges as in the Leslie Miller lamp, and the phenomena of radio-activity—that newest development of chemical science. The grievous nature of cancer and the distress of mind from which its victims suffer make it a subject which must be discussed without enthusiasm. The discredit which has attached to the cancer-curing impostors of the past will deservedly be ours unless we are particularly careful to keep rigidly within the bounds of observed facts. In a semi-public assembly like the present one we must be excessively careful to avoid anything like over-statement of the case. The line which I believe we can most advantageously follow to-day will be that of relation of cases and the discussion of practical points—such as the best sort of tube, the best time of exposure, the number of applications which has been found most suitable, and so on. First let us examine the observed facts upon which there is now a general agreement of opinion among x-ray workers—namely, (1) that in rodent ulcer a satisfactory result may be often observed; (2) that healing of an ulcerated cancerous surface has been observed in a certain portion of cases; (3) that relief of pain in cancer is a fairly common experience; and (4) that superficial nodules, undoubtedly cancerous in nature, will sometimes decrease notably in size under x-ray treatment. This is the groundwork upon which we hope to be able to build, but the edifice is not yet built, nor do we even know whether we shall ever advance much further. Having reached our present position we are searching, I might say groping, in the dark for a fresh clue to enable us to progress another stage. What direction shall we take? Shall we use hard tubes, soft tubes, or medium tubes? Shall we operate our tubes with the anti-cathode red-hot or cool? Shall we have the tube close to the part or remote from it? Do we desire a reaction of dermatitis or do we need to avoid it carefully? No one knows, though some of us have opinions. Only a sifting of cases and a comparison of results will in time teach us whether these points matter or not. If we have no successes to relate let us tell of our failures and try to learn from them. The successful treatment of rodent ulcers by the x rays is now sufficiently established for us to leave it on one side at present. I do not mean that there is no more to learn about this particular disease but that the points not yet worked out are such as may be left for the present to individual investigators. I would suggest, therefore, that to-day we should limit our remarks to cases of undoubted sarcoma or carcinoma. If it were possible to do so we would choose to begin in the case of carcinoma with simple superficial

epithelioma, as for example, epithelioma of the lip in its earliest stages. If in such cases it could be satisfactorily established that a complete disappearance of the growth followed the treatment, it would be reasonable to advance to the more difficult problems of deeper growths. Unfortunately, these are just the cases which we cannot as yet obtain. Naturally the surgeon who feels that an immediate cure can be secured by a prompt operation is reluctant to run the risk of sacrificing his patient's chances by any procedure which involves delay. His attitude is not likely to change until it can be shown that the results of treatment by the x rays are as good as those now obtained by excision. That is the position of affairs to-day and the only material which is available for the study of the effect of the x rays upon malignant disease is among cases which are too extensive or too deeply seated for the surgeon to be able to touch them. Naturally this complicates matters a good deal and adds very greatly to the difficulties of the position. In spite of these difficulties cases have been recorded which show that the progress of epithelioma can be profoundly influenced by the application of the x rays. Even if we pass over partial successes and consider only such as are complete we find some satisfactory evidence to support us. Macintyre of Glasgow has recorded a case of epithelioma which filled the nasal cavity; eight months later the whole neoplasm had disappeared under x-ray treatment. The diagnosis of the case was confirmed by microscopical examination. In looking through the published records of the use of the x rays in cancer one cannot help feeling surprised to find how few of the alleged successful cases have been so recorded as to carry to those who read a reasonable conviction of success, and this, too, in spite of the fact that numbers of people are working at this subject, and scores, if not hundreds, of cases have been treated. Half a dozen cases of unmistakeable cure of undoubted cancer, if minutely reported, would be worth more just now than any number of vague statements about partial improvement, favourable effects, and the like. The more one examines the published cases the more suspicious one becomes. In most of them there is some flaw in the evidence. Either the diagnosis is uncertain or the patient is not more than partially relieved at the time of writing or he has been so unfortunate as to die from some intercurrent disease. It is greatly to be wished that all medical men who have recorded favourable cases will periodically supply further notes of the later progress of their patients. In short, while there is a quantity of evidence to support the contention that the x rays act beneficially in malignant disease the amount of evidence to show that cures have resulted is lamentably meagre. What can be the explanation of this? Here is an agent which very commonly gives relief to some of the symptoms produced by a malignant growth and yet fails to give as much relief as is really required. Is it because of some defect in our technique, or is it because the cases subjected to x-ray treatment are ill chosen, or, finally, is it from some inherent defect of the method of a fundamental kind? This is the crux of the situation. First as to technique. Have we yet to discover that some tubes only emit the right kind of x ray? Have we to use our tubes differently? or do we fail from insufficient perseverance? The nature of the tube, the degree of penetration of the rays which it gives off, the proximity of the tube to the affected part, the production of a reaction or not, are all points on which further knowledge is wanted. Already there is a divergence of opinion as to the need for a dermatitis or not, for while some observers think that the good effect is in proportion to the amount of dermatitis, others hold a quite opposite view. Secondly as to the selection of cases. Most of us will agree that the cases hitherto submitted for x-ray treatment have been of the most unpromising character. Most, if not all, of them have been of a kind which were already too advanced to be other than practically hopeless from the first. And whereas the failure has usually been from the reappearance of the disease in a vital organ remote from its original seat, the application of the x rays has so far justified their employment by improvements at the place to which they were applied. Thirdly, as to inherent defects in the x-ray method. It may be that all our efforts will be in vain because of this; but until the method has been tried for simple cases at an early stage we cannot abandon our attempts. In my opinion the proper course to adopt would be to start the x-ray treatment as soon as possible after the removal of the primary growth by

the surgeon and not to wait until recurrences have seriously spoiled the chances of success. I would avoid all masking of the surrounding parts by impervious screens for fear lest the screens should shield some foci of disease. It is probable that the use of lead screens have contributed a good deal to the failures of the past. I would use a medium tube and would prefer to operate with a hot anti-cathode. I would avoid dermatitis by arranging the exposures suitably and I would continue the treatment with occasional breaks for three, four, or five months. In conclusion, it is necessary to speak of other proposed electrical methods—namely, the high-frequency method and the use of the static machine. Both of them have been tried and both have had some slight success to show. In both methods there is a common factor—namely, the presence of cathode rays—and it seems to me possible that these may require further examination. Curiously enough, radium has lately been tried for the relief of cancer and cases of its favourable action have been mentioned. The rays emitted by radium are of two kinds, one apparently identical with the x rays and one with the cathode rays, and it may be that the combination of the cathode rays with the x rays has some special advantage.

MR. J. F. HALL-EDWARDS (Birmingham) continuing the discussion said that the failures so far noted were largely due to the extremely unfavourable character of the cases submitted to the treatment. He had no doubt at all that cases of early epithelioma of the surfaces of the body could be cured by the x rays in a satisfactory manner. As to internal cases he had treated a case of cancer of the rectum by applications to the sacral region, and his patient was alive still after three years had elapsed and the growth had diminished in size. He had often noticed that with the appearance of a dermatitis the patient began to feel better. He would like to know whether the use of the x rays did harm in some cases by leading to the liberation of toxins during the process of regression of the tumours under treatment. He agreed in preferring a medium tube with a hot anti-cathode. He insisted less now than he had formerly done on the necessity for producing a sharp dermatitis.

MR. CHISHOLM WILLIAMS (London) had obtained good results from the use of the high-frequency machine. His method was, he believed, very important if successful results were to be obtained by that apparatus. He used an electrode of glass tube so exhausted as to emit x rays. Its vacuum could be judged by seeing whether the wall of the tube emitted a green phosphorescence. If it did this x rays were being produced. There were present, therefore, x rays, cathode rays, ultra-violet light, and general electrification. The tube could be put in contact with the patient and x-ray burns were not at all likely to result. He had obtained marked relief in many cases but had no complete cure to record as yet.

DR. C. H. ALLFREY (St. Leonards) suggested that drugs might be employed together with the electrical treatment; possibly iodide of potassium might be useful to remove the products of the breaking down of the growths.

DR. HORACE MANDERS (London) had tried experiments with the high-frequency current, using vacuum electrodes of blue glass, particularly of cobalt glass. He advised the study of the pulse tracings during and after treatment, also a careful examination of the urine.

DR. LOVELL DRAGE (Hatfield) had found benefit in many cases of malignant disease from the use of cinamate of sodium as a hypodermic injection; he thought that this method might give improved results if combined with the electrical treatment. The effect of cinamate of sodium had been surprisingly good in some of his cases.

Among other matters touched on was Radium and its Possible Therapeutic Uses. It was pointed out that radium had one valuable quality which would help in proportioning the times of exposure—namely, that its radiations were uniform in strength.

THE PRESIDENT, in closing the discussion, said that several valuable points had been elicited by the debate. He believed that the vacuum electrode used with a high-frequency coil might develop into a useful instrument. The diffused x rays offered some advantages, particularly in the diminished risk of x-ray burns, and it was highly probable that the coexistence of cathode rays around such a tube might be useful. He had treated a patient after an operation for the removal of a recurrent carcinoma in the glands of the neck with the object of preventing a further recurrence. After three months of mild x-ray treatment the scar of the operation

wound began to feel hard and it was again excised. A microscopical examination showed the presence of a few cancer cells, much fibrous tissue, and some extravasated blood corpuscles, and the pathologist who reported on the specimen was doubtful as to its exact character. The specimen removed at the preceding operation was of typical carcinoma, rich in cells. The x rays seemed, therefore, to have influenced the growth and to have altered its character in a favourable direction. He thought that a more vigorous application of the rays might have been successful in preventing the reappearance. He hoped that the subject of x-ray treatment for malignant disease would again come before the Subsection of Electro-therapeutics in 1904 and that further advances might by that time have been achieved.

THURSDAY, JULY 30TH.

Mr. CHISHOLM WILLIAMS opened a discussion on

The Treatment of Tuberculous Diseases by Electrical Methods.

He said that he had treated 43 cases of pulmonary tuberculosis by high-frequency methods. After two years 40 patients were living, though one was now very ill with tubercle of the urinary tract. An examination of the sputa showed an increase of bacilli for a time followed by a decrease. It was also common for the patients to have a distinct rise of temperature for a few days. As soon as this subsided the patients showed manifest improvement. In tubercle of other regions of the body the results at present were uncertain. In lupus the high-frequency treatment by the high vacuum glass tube was very satisfactory.

The PRESIDENT having pointed out that the discussion might be conveniently arranged under the heads of pulmonary tuberculosis, tubercle of other organs, and lupus, most of the later speakers dealt mainly with lupus.

Dr. P. S. ABRAHAM (London) expressed a preference for the x rays in the treatment of lupus and pointed out the peculiarity that cases apparently identical might behave quite differently under apparently identical treatment.

Dr. J. S. BOLTON (Nottingham) recounted his experiences in pulmonary tubercle and thought that the high-frequency treatment had a bad effect if applied to subjects in whom a hectic temperature existed.

Dr. V. RUTHERFORD (London), Dr. R. B. MCVITTIE (Dublin), Dr. H. H. HULBERT (Bexhill-on-Sea), and Dr. JOHN HADDON (Denholm, N.B.) also spoke.

Mr. HALL-EDWARDS read a paper on Some Points in X-ray Therapeutics and Mr. W. K. WILLS (Bristol) showed a Modification of the Leslie Miller Lamp, in which the iron discharging points were altered to carbon with iron cores.

FRIDAY, JULY 31ST.

Dr. J. C. FERGUSSON (Great Malvern) read a paper on High-frequency Currents as a Remedy for some Forms of Deafness.

Dr. DONALD BAYNES (London) read a paper on the Treatment of Painful Amputation Stumps by Electricity.

Dr. W. S. HEDLEY (London) contributed a paper on Practical Muscle-testing which was read by the Secretary.

Dr. BOLTON opened a discussion on X Rays in the Diagnosis of Thoracic Disease.—Dr. W. H. I. SELLERS (Preston), Dr. FERGUSSON, Dr. J. E. GARNER (Preston), Dr. MCVITTIE, and Mr. CHISHOLM WILLIAMS joined in the discussion.

The subsection was well attended throughout the meetings and had an attendance ranging between 25 and 35.

OBSTETRICS AND GYNÆCOLOGY.

FRIDAY, JULY 31ST.

Mr. J. H. TARGETT (London) opened a discussion on

The Diagnosis and Treatment of Tuberculosis of the Uterus and Adnexa.

He said that it was not until 1886 that attention was drawn by Hegar to the importance of this affection; in 1894 Whitridge Williams gave a good account of it and at the Fourth International Congress of Obstetrics and Gynæcology held in Rome in 1902 the subject was fully discussed. In the post-mortem records of Brompton Hospital it was shown that in 6 per cent. of tuberculous females there was disease of these organs. The number of cases in which the disease was primary and limited to the genital organs was much smaller. The modes of infection were: 1. By the blood stream, the seat of original infection being in the lymphatic glands, particularly the bronchial. The tubes were readily infected.

2. By the peritoneum, either from general miliary tuberculosis of the peritoneum or from localised disease due to ulceration of the neighbouring bowels, or the fluids in the peritoneal cavity may convey the infection through the abdominal ostium. Tuberculous salpingitis was found in 50 per cent. of the cases of tuberculous peritonitis. 3. By direct infection from the neighbouring organs—i.e., the ileum, the rectum, and the bladder. 4. From sexual intercourse; this could not be denied, though it was very rare. Tuberculosis of the glans penis was excessively rare and the infection must come through the semen. The forms of tuberculous disease met with were: 1. Acute tuberculous salpingitis. This mostly affected the outer end of the tube; the rugæ were studded with tubercles. The fimbriæ were not obliterated as in ordinary salpingitis and the orifice of the tube was often patent. Hæmatosalpinx and pyosalpinx might develop. 2. Caseous salpingitis. 3. Tuberculous pyosalpinx. The peculiarities of this form of pyosalpinx were (1) that the fimbriæ were present; (2) the contents were honey-like and often sterile bacteriologically; and (3) there was absence of adhesions and in consequence twisting of the pedicle sometimes occurred. Tuberculosis of the body of the uterus might be diffuse miliary and non-ulcerative, or granular, friable, and caseous; or there might be pyometra from the cervical canal being blocked. In the majority of cases of tuberculosis of the uterus the infection came from the tubes. As regards the symptoms and diagnosis of tuberculosis of the uterus some writers said that recognition was impossible, but with this he did not agree. The previous history, particularly with reference to any tuberculous disease, was very important. The absence of any apparent cause was suggestive; thus pyosalpinx in the virgin was almost always tuberculous. It was formerly taught that amenorrhœa was present, but further experience had shown that this was not so. Dysmenorrhœa was a common symptom. As regarded pain it might be stated generally that this was not present unless other organisms were associated with the tubercle bacillus. Large pyosalpinx without pain, especially without recurrent attacks of pain, was usually tuberculous. When the disease affected the body of the uterus there were bacilli in the discharge or in curettings, but in about 1000 specimens from curettings which he had examined he had found tubercle in only seven. In the treatment of the disease laparotomy was very beneficial. When the operation was performed for tuberculous peritonitis and thickened tubes were found these should be removed; but he had seen some cases where rapidly fatal results followed interference, in one case in 12 hours and in another in 24 hours, and he doubted the wisdom of removing very adherent and caseous tubes, though there was no doubt of the advisability of removing tuberculous pyosalpinx. At the close of his remarks Mr. Targett gave a lantern display of a series of 18 very fine photographs of specimens of tuberculous disease of the uterus and adnexa.

Dr. J. A. C. KYNOCH (Dundee) then read a paper on

Primary Tuberculosis of the Uterus (Cervix).

There were, he said, three forms: (1) ulcerative, (2) miliary, and (3) papillary. The last extended on to the vaginal portion; there was no friability but the growth bled readily on examination. There was menorrhagia or amenorrhœa, the former occurring in the early cases and the latter in later ones. Hysterectomy was performed, curetting not being sufficient on account of the possibility of infection of the uterus.

Dr. ARNOLD W. W. LEA (Manchester) read a paper entitled

Five Cases of Tuberculous Disease of the Tube treated by Operation.

He said that the diagnosis of removed specimens should never be made without a microscopical examination, as nodules having a naked-eye resemblance to tuberculous nodules were sometimes met with in other conditions. In two of his cases no other part of the body was affected; in only one was the ovary affected. The symptoms included pain which was a marked feature; the effect on menstruation varied. It was never possible to rely on the presence of bacilli in the vaginal discharge. The previous history was very important; there was usually sterility. The evening rise of temperature was also important. Spontaneous cure by the development of fibrous tissue was possible. The technique of the operation was to ligature the uterine cornu first, then to ligature by sections across the broad ligament, and afterwards to suture the peritoneum over. If drainage was used it should be per vaginam.

Dr. HERBERT SNOW (London) thought that congestion of the pelvic organs produced by corsets favoured the development of tubercle. He advocated milder methods of treatment than hysterectomy.

Dr. F. W. N. HAULTAIN (Edinburgh) said that in operating for tuberculous peritonitis they should pay particular attention to the tubes. In regard to the diagnosis of tuberculosis of the tubes dysmenorrhœa was the most constant symptom. He narrated a case of tuberculous disease of the cervix and showed a drawing of the condition. The patient, a single woman, *virgo intacta*, had had a discharge for seven years. She had a peculiar soft growth of the cervix which was not bleeding on examination but had a bluish colour. Supravaginal amputation of the cervix was performed and on microscopic examination the growth proved to be tuberculous.

Dr. E. J. MACLEAN (Cardiff) narrated a case of tuberculosis of the tubes in a patient, aged 34 years, who had been married four and a half years and was sterile. She had suffered for four months from pelvic pain, dyspareunia and definite pain referred to the umbilical region, menorrhagia, and leucorrhœa. There was a swelling in the pouch of Douglas. At the operation both tubes were found studded with tubercles and containing caseous matter. The adnexa were non-adherent. The right ovary contained a cyst of the size of a walnut. Both the tubes and the ovaries were removed and the patient became strong and gained flesh after the operation.

Dr. C. R. STRATON (Salisbury) narrated a case of tuberculous disease of the cervix and the vaginal wall apparently due to infection from the patient's husband who was suffering from renal tuberculosis.

Mr. TARGETT, in reply, said that the x-ray treatment was not likely to do good in tuberculous disease of the cervix, as all specimens showed deeply placed nodules. He did not advise removal of the uterus with the tubes. It was doubtful whether the pure tubercle bacillus was a pyogenic organism, and when pus was present he would always suspect that other organisms were present. He had met with two cases of tuberculous peritonitis in which tubal gestation had occurred.

Dr. A. H. N. LEWERS (London) communicated a paper (which was read by the Vice-President) entitled

A Case of Hairpin in the Uterus discovered by the X Rays.

The patient went to the London Hospital and said that she was pushing in the hairpin in order "to open an abscess" when it disappeared. On examination there was some blood-stained discharge but nothing could be felt of the pin. The uterus and the bladder were examined by the sound with negative results. A radiograph taken by Mr. HANMAN showed the hairpin distinctly lying with its points downwards. Under anæsthesia the cervix was dilated with Hegar's dilators and each point of the hairpin was seized with a Spencer Wells forceps and the pin was extracted. There was also found a mass of placental tissue of the size of a walnut but no foetus. The patient became very ill after the operation, having a rigor and a temperature of 106° F. Subsequently pelvic cellulitis and suppuration in the left thigh developed, the latter necessitating incision. An incision was also made into the vaginal roof and pus was evacuated. Ultimately, however, she completely recovered. Reference was made to the literature of the subject of foreign bodies in the uterus. Negebauer had recorded 74 cases and of these 16 were due to hairpins. This was the first case recorded in which the diagnosis had been made by the x rays.

A vote of thanks to the President (Professor W. Stephenson (Aberdeen), proposed by Dr. HEYWOOD SMITH (London) and seconded by Dr. F. J. MACAN (London), concluded the proceedings of the section.

STATE MEDICINE.

THURSDAY, JULY 30TH.

Dr. JOSEPH GROVES (Isle of Wight) contributed a paper upon

Security of Tenure for Medical Officers of Health

in which he discussed the anomalous position of the provincial medical officers of health and advocated for them the same security against capricious dismissal or non-re-election as that which had already been conceded to the metropolitan and the Scottish medical officers of health and to the Poor-law officers in England and Wales. He quoted the opinions of many Members of Parliament on the subject, including

that of Sir Walter Foster who, when Parliamentary secretary of the Local Government Board, said that the Board considered appointments for short periods and precarious tenure injurious to the public health.

Mr. HERBERT JONES (Hereford) pointed out that it was principally through the report of the medical officer of health that the Local Government Board could ascertain whether the Public Health Acts were being properly administered and there was a distinct Gilbertian humour in the readiness with which a medical officer of health could be got rid of by a defaulting sanitary authority whose inactivity he had merely mentioned in his annual report.

Dr. F. J. H. COUTTS (Blackpool) and Dr. A. E. MOLE (Gower) agreed with the views of the previous speakers and the PRESIDENT, Dr. J. C. McVAIL (Glasgow), said that it must be extremely difficult to produce an argument in favour of the existing conditions. The medical officer of health being constantly in opposition to someone needed security far more than did the Poor-law medical officer.

FRIDAY, JULY 31ST.

Dr. F. G. BUSHNELL (Plymouth) contributed a paper on

Ministries of Public Health

in which he advocated the establishment of a Ministry of Public Health based on the expanded medical department of the Local Government Board in coöperation with the General Register Office and having associated with it a consulting body of eminent representative members of the medical profession, including the Presidents of the Royal Colleges of Physicians of London and Surgeons of England. He thought that the Minister at the head of this new department would best serve the interests of public health if he did not go out of office with every change of the Government and was summoned only to those meetings of the Cabinet which were concerned with the work of his department.

Mr. H. H. TIDSWELL (Cardiff) thought that general practitioners might do more in furthering public health questions among their working-class patients. He would like to see more medical men appointed as assistants to medical officers of health.

Dr. GROVES spoke of the non-appreciation of the work of the Local Government Board in high quarters and said that medical officers of health were handicapped by an insufficiency of inspectors.

Mr. H. D'ARCY ELLIS (Stourbridge) thought that the public health service might be organised on the lines of the Factory Department of the Home Office which had done remarkably good work since Dr. B. A. Whitelegge had been chief inspector. He was of opinion that medical officers of health did not receive that support from the Local Government Board which they were entitled to expect.

The PRESIDENT said that the question of the appointment of a Minister of Public Health had been before the country for at least 20 years and there was no doubt that inquiry into the public health administration of England and Wales was necessary in view of the introduction of a new Public Health Bill before very long.

Mr. TIDSWELL, in introducing a discussion on

Physical Degeneration in Children of the Working Classes,

said that his object was to draw attention to certain physiological influences which, he considered, were responsible for the nervous restlessness and waywardness so characteristic of the children attending public elementary schools. There was, in his opinion, some factor having a bad influence on the health of children which did not exist before the Education Act of 1870 came into force. The system of cram was turning children into talking machines, and in injuring their reasoning powers it was both demoralising and degrading, and was calculated to render the judgment unstable and capricious and to interfere seriously with the mental and moral equilibrium. He advocated the entire abolition of corporal punishment in schools and urged the systematic inspection of all schools by a medical officer attached to each school who should see every class as it assembled with a view to detect infectious and other diseases in their early stages and who should examine the eyesight, the teeth, the hearing, and the general condition of the children and should visit any pupil at home in case of sudden illness.

Dr. DAWSON WILLIAMS (London) said that they required a definition of "physical degeneration" and asked whether the conditions which produced physical degeneration were more

active now than they were formerly, for there was not any statistical evidence that the amount and degree of degeneration in the population were increasing. The practical question appeared to be whether the factors which tended to prevent adequate physical development could be removed. He hoped that the decline in the birth-rate would not be mixed up with the question of deficient physical development, for degeneration might begin in utero, and attention should be given to safeguarding the health of the mother during pregnancy. If there was an increased degeneration it might be due to the altered forms of food which were partaken of in towns and whether the use of starchy foods for infants had increased or not it was certainly excessive. He believed that the defects in the diet of infants caused a condition of defective nutrition which accounted for not only physical mal-development but imperfect or retarded cerebral development which was the cause of what was called over-pressure. He thought that it was a mistake to use the terms "mind" and "brain" as interchangeable, for the mind could not be tired but the brain when tired was obliged to rest. He agreed with Mr. Tidswell that medical inspection of schools was desirable but he doubted whether it would be proper to follow the children to their homes.

Mr. J. M. MACKENZIE (Kirkby-in-Ashfield) thought that physical degeneration was partly acquired and partly transmitted. He was of opinion that medical men could not deal with the question alone but must call to their aid both the parson and the schoolmaster.

Mr. JOHN STRACHAN (Dollar) protested against children being required to do a large amount of work at home in addition to their lessons at school and pointed out that those who did the best at school often had a larger proportion of work at home.

Dr. H. W. LANGLEY BROWNE (Dudley) considered that the medical profession were to blame in not calling the schoolmaster more often to their aid. He did not think that the medical officer of health or the medical officer to a school should visit children in their homes. He believed that the alien immigration was deteriorating the British race, though he considered that the main factor in the degeneration was the food question.

Dr. GROVES looked to syphilis as one of the greatest causes of physical degeneration and deplored the repeal of the Contagious Diseases Acts.

The PRESIDENT said that if physical degeneration were so pronounced as had been maintained it would surely have had some effect upon the death-rate, whereas the death-rate had gone down. He considered that children should be allowed to grow up more naturally, for they were often living and breathing in places and under conditions which were deleterious to their health, although those conditions could be altered at little or no expense. He approved of the medical examination of children in schools.

Mr. W. JONES MORRIS (Portmadoc) contributed an exhaustive paper upon

The Housing of the Working Classes in Small Municipalities in which he detailed the action which had been taken in the town of Neath for the provision of workmen's houses. He urged the erection by municipalities of model houses which should act as types for the private builder to follow.

The lateness of the hour prevented any discussion upon this paper.

PSYCHOLOGICAL MEDICINE.

WEDNESDAY, JULY 29TH.

Proceedings in this section were opened by an Address from the PRESIDENT, Dr. ROBERT JONES, which was published in THE LANCET of August 8th, p. 366.

Dr. W. FORD ROBERTSON, pathologist to the Scottish Asylums, then opened a discussion on

The Pathology of General Paralysis.

He stated that the pathogenesis of general paralysis was still unknown with anything like accuracy and that so long as this was so they had no right to conclude that the disease was incurable. The view that general paralysis of the insane was essentially syphilitic in origin, though held by the majority of neurologists at the present day, had never been proved; it was no more than a hypothesis. Against the essentially syphilitic origin of general paralysis was the fact that many clinicians had seen and reported cases of general paralysis in which syphilis had not previously occurred and that numerous cases were now known in which syphilis was

contracted after the onset of the symptoms of general paralysis. The argument used to support the doctrine, "No syphilis, no general paralysis," based upon statistics showing a high percentage of antecedent syphilis in cases of general paralysis, was marred by a constant failure to take into account the fact that only a very small proportion of syphilitics ever became general paralytics or tabetics. Similar statistical evidence could be adduced showing that very high percentages of persons affected by tuberculosis had previously had measles. Indeed, they knew that an attack of measles predisposed to tuberculosis, yet they did not on that ground conclude, "No measles, no tuberculosis." Moreover, the syphilitic hypothesis did not explain the clearly established fact that there were other conditions, such as chronic alcoholism, lead poisoning, and excessive meat diet, which favoured the development of general paralysis. Post-mortem examination of the non-nervous organs or tissues of the body in cases of general paralysis showed that an active bacterial toxæmia was present. Dr. Lewis Bruce and Dr. Robertson had directed attention to the gastro-intestinal disorders that occurred in cases of general paralysis and had published their belief¹ that general paralysis was dependent upon a toxæmia of gastro-intestinal and bacterial origin, but Dr. Bruce had since modified his view so as to regard toxic infection by the bacillus coli as a secondary or terminal infection and not as a primary cause of general paralysis. More recently the hypothesis had been advanced by Dr. G. D. MacRae, Dr. John Jeffrey, and Dr. Robertson himself that general paralysis was the result of a chronic toxæmia dependent upon the excessive development of bacteria not only in the alimentary canal but in the nasal tract and throat, and especially upon the abundant growth of a diphtheroid bacillus which gave the disease its distinctive characters. The recognised causes of general paralysis, such as syphilis, alcoholism, plumbism, and excessive meat diet, acted as stimulants of the leucoblastic tissue of the bone marrow or directly damaged this tissue, so that the defences of the body against the invasion of bacteria were diminished or damaged. The marrow cells (myelocytes) from which the polynuclear leucocytes were derived had a definite limit as regards proliferative capacity, so that after long periods of damage sustained or of excessive proliferation undergone they could no longer generate leucocytes for the defence of the body against bacteria. The protective functions of the body were thus impaired and in such circumstances the bacteria of the alimentary canal, nose, and throat normally present as saprophytes assumed a pathogenic character by reason of the protective forces of the body being weakened. Hence arose a condition of bacterial infection and invasion from the alimentary canal and upper respiratory tract. In such conditions the body, if it desired to survive the invasion of such toxins and bacteria, was obliged to increase its auxiliary defences—that was to say, body cells which ordinarily took only a subordinate part in the destruction of foreign invaders were now roused to active antitoxic or phagocytic functions. It was only in constitutions damaged to this extent that a special toxæmic and saprophytic infection occurred which led to the development of general paralysis. This special infective agent, the one which was dominant in, and was characteristic of, the onset of general paralysis—was a diphtheroid organism—i.e., one resembling the Klebs-Löffler bacillus in culture and morphology, but not identical with it, and the view was advanced that this organism was an "attenuated form" of the Klebs-Löffler bacillus. It had a pathogenic action upon rats. The febrile rises of temperature, the disorders of digestion, the leucocytosis, the chronic sore-throat and septic condition of the mouth observed in general paralytics, and the frequently obtainable evidence of chronic bronchitis all tended to show that the general paralytic was suffering from a bacterial toxæmia. The stomach, throat, and lungs of the general paralytic usually showed evidences of chronic catarrh. The stomach itself might show little or no alteration but the ileum was constantly affected. The tonsils of the general paralytic were frequently enlarged or more commonly they were extremely atrophic. The crypts of the tonsils were filled with pus and the lungs showed evidences of long-standing local bacterial infection. A great development of plasma cells and of "fuchsin bodies" marked such areas of local bacterial infection. These plasma cells were auxiliary defences of the body and their great development

¹ Brit. Med. Jour., June 29th, 1901.

in such localities was an indication that a special call had been made upon them to combat bacterial invasion. Cultures made during life from the nasal and pharyngeal secretions of general paralytics resulted in the development of micro-organisms far in excess of the normal in numbers. A washing from the stomach in one case of general paralysis showed great numbers of bacteria. The septic cystitis to which general paralytics were specially prone was attributable to bacteria absorbed from an unduly septic alimentary canal and excreted by the kidneys in the urine. Cultures were made in post-mortem examination of 20 cases of general paralysis, the nasal or intestinal contents being used for this purpose. In 17 cases out of the 20 the cultures furnished evidence, in addition to other bacteria, of the presence of the diphtheroid bacillus already alluded to, and in the three remaining cases the bacillus was found by other methods of detection. In eight out of the 20 cases this organism was present in very great numbers. A recent series of cultures from the secretions of the nose and throat of ten general paralytics at the Edinburgh Royal Asylum showed that the diphtheroid bacillus was present in nine cases. Out of 16 cases of general paralysis where cultures were made from the brain post mortem four showed the presence of the diphtheroid bacillus. The bacillus in these four cases must have obtained an entry either by the blood or by local infection of neighbouring parts (internal nasal cavities or internal ear). A filamentous variety of the diphtheroid bacillus had also been met with in the lymphatics of the intestines in a few cases and was to be regarded as a terminal infection. The diphtheroid bacillus when introduced into the alimentary canal of rats gave rise to certain morbid symptoms which progressed until death occurred. Changes closely resembling those that were present in general paralysis were met with in the brains of these rats. The changes were observed in the nerve cells and in the non-nervous tissues (blood-vessels and neuroglia) alike. The whole body of facts included in the above investigations therefore supported the view of the specific bacillary origin of general paralysis of the insane.

In the discussion which followed the PRESIDENT stated his belief that in the vast majority of cases and upon the weight of indisputable evidence syphilis was an antecedent of general paralysis. The results of trophic peripheral changes led to secondary catarrhs and bacterial infections (tonsillary, bronchial, intestinal, and a variety of others) in various parts of the body, but these he regarded as natural to the later stages of general paralysis and as non-essential to its causation.

Professor D. J. HAMILTON (Glasgow) mentioned a rare case of bacillary infection of the spinal cord which followed upon a railway accident without external injury in a young girl.

Professor J. G. ADAMI (Montreal) cited evidence to show that bacteria of low virulence and their toxins might have undoubtedly a progressive action upon the nervous system. General paralysis was a chronic state leading steadily to a greater and greater weakness of the body as a whole, favouring what he had termed "sub-infections" of various types, and while prepared to believe that a diphtheroid bacillus might be an accessory factor in general paralysis he would be cautious in accepting it as a specific agent in the production of the disease.

Dr. J. F. FLASHMAN (Balmain, Australia) thought the facts brought forward might be of assistance in explaining cases of general paralysis not due to syphilis.

Dr. FLETCHER BEACH (London) inquired whether the bacillus and the lesions attributed to it had been met with in cases of juvenile general paralysis the etiology of which was almost invariably syphilitic.

Dr. F. W. MOTT (London) said he still believed that syphilis was the most important and frequent cause of general paralysis. He inquired whether the diphtheroid bacillus was met with in the very earliest stages of general paralysis. He cited cases of chronic poisoning with abrin and ricin in animals where changes in the brain were produced resembling in many respects those of general paralysis. He also inquired whether plasma cells were present around the cerebral blood-vessels of rats fed on the diphtheroid bacillus.

Dr. W. LLOYD ANDRIEZEN (London) emphasised the etiological and clinical frequency of syphilis and described the changes in the cerebral vessels and meninges in early cerebral syphilis within three years of infection. All stages could be found between these cases and those

of general paralysis supervening from 10 to 15 years after infection. There was continuity of symptoms and of pathological lesions between these two classes of affections. He also cited cases of improvement by the "intensive" mercurial treatment of general paralysis. He regarded the diphtheroid infection, like the cystitis of general paralysis, as a subterminal and secondary state not essential to the etiology of the disease.

Dr. MAULE SMITH (Wakefield) had met with a diphtheroid organism in two patients dying from asylum dysentery, but he had not found this organism in general paralysis. He inquired whether this organism was to be regarded as infective from one patient to another.

Dr. DAVID YELLOWLEES (Glasgow) was not disposed to accept Dr. Robertson's views as to the diphthero-bacillary origin of general paralysis in the face of clinical evidence which was overwhelming. He agreed that syphilis was a very frequent but not the sole cause of general paralysis.

Dr. F. EDRIDGE-GREEN (London) believed that syphilis was the cause of general paralysis and of tabes. The patient had in many cases seemed to suffer very little from the immediate effects of syphilis and had led a very steady life afterwards, but nevertheless in 10 or 15 years' time general paralysis or tabes was developed.

Dr. J. HADDON (Denholm) was glad to think that lunacy might be due to a microbe and regarded Dr. Robertson's diphtheroid microbe as a discovery in this direction. He, however, was of opinion that lunacy (including general paralysis) was caused by civilised habits of injudicious feeding and errors of diet and thought that attention to this source might serve to prevent cases of insanity arising from gastro-intestinal disorders and consequent auto-intoxication.

Dr. E. GOODALL (Carmarthen) inquired whether the diphtheroid organism was present in the colon and at the ileo-cæcal valve, where the inhibitory action of the intestinal wall on bacteria was least marked, and whether the brains of rats fed with cultures of the bacillus showed degeneration of the tangential fibres.

Dr. T. B. HYSLOP (London) said that the accumulated work of clinicians all over the world had established syphilis as being the chief cause of general paralysis and he believed that the bacillus of Dr. Robertson was part of a terminal infection occurring in the advanced stages of general paralysis.

Dr. ROBERTSON, in reply, stated that he realised the etiological importance of syphilis, but asserted that the general and local impairment of the alimentary and respiratory tracts, permitting bacterial invasion and toxæmia, constituted the main and the essential constituents in the production of general paralysis.

Dr. R. S. ROWS (Whittingham) read a brief paper on

Cavities in the Spinal Cord,

illustrated with lantern slides. Three different cases were described and illustrated. In the first of these the cavity formation was due to atrophy of the nervous tissue and the neuroglia, in the second to syringomyelia, and in the third to hæmorrhage into the perivascular spaces and substance of the spinal cord.

THURSDAY, JULY 30TH.

Dr. HYSLOP opened a discussion on

Alcohol in its Relation to Mental Diseases.

He considered alcohol in its relationship to physical and mental processes and argued that the rôle of alcohol in the healthy human body was more evil than good and that its use was abuse. In the unhealthy body the use of alcohol was compared to a loan raised at heavy interest which might be employed to cope with immediate and pressing needs but which constituted a heavy burden on the borrower until repayment was completed. Alcohol produced an illusory sense of well-being and of mental energy and capacity without in any way enhancing mental power. On the contrary, even in moderate doses it tended to lower the ability of performing the more complex and difficult parts of any task, physical or mental. It tended to accelerate and to confuse thoughts and ideas without regard to the logic of circumstances and it stimulated the subject to restlessness and to overaction. The vascular system responded to the presence of alcohol by vaso-dilatation and by increased exudation of lymph into the perivascular tissues, and in chronic alcoholism a number of characteristic vascular and perivascular changes were thus set up in the brain. The increased exudation of lymph from the blood-vessels carried

with it an increase in the number of extravasated leucocytes which thereafter underwent rapid destruction and dissolution. Alcohol, moreover, acted deleteriously by absorbing oxygen from the blood corpuscles or from the plasma, for the oxygen thus taken up was necessary for the normal processes of metabolism of the nerve cells. Dr. Hyslop then referred to the neuron theory and to the pathological changes met with in the brain in cases of chronic alcoholic insanity as described by Andriezen, Berkley of Baltimore, and others, and stated that the lesions described by these authors undoubtedly afforded a physical and neurological basis for the clinical symptoms observed in such cases during life—viz., the amnesia, the muscular weakness, and the slowness of reaction time of the chronic alcoholic subject. In conclusion, it was suggested that alcohol *per se* did not cause general paralysis of the insane.

Dr. G. ARCHDALL REID followed with a paper on

Human Evolution with Especial Reference to Alcohol.

Starting from the assumption that all the races of mankind sprang originally from a common stock and that by divergence and progressive change from the original stock the existing races were produced, it was argued that human individuals differed in their power of resisting diseases and that the offspring tended to inherit this parental power or weakness in particular. An example of this was cited in the case of the negroes who as a race were more resistant to malaria than the British, while it was said that *per contra* the British were more resistant than the negroes to pulmonary tuberculosis. "The British, who for thousands of years have been afflicted by phthisis, measles, and whooping-cough, are much more resistant to these diseases than the inhabitants of the Western hemisphere, who have known them only during the last few generations and who are now being exterminated by those diseases." Parental disease, continued Dr. Reid, did not affect in any way, either for good or evil, offspring born subsequently; at any rate, such offspring did not inherit the disease or the good or evil sequelæ of the disease. He challenged anyone to produce genuine instances of so-called "degeneration" of the offspring arising from, or caused by, plumbism, gout, pulmonary tuberculosis, syphilis, or other diseases of the parents. The prevalent belief largely held by the profession that such diseases were actual and potent causes of "filial degeneration" he regarded as an ancient superstition resting on bad observation. The most convincing argument against the popular view was as follows. If parental disease affected the offspring subsequently born then the morbid condition thus reproduced in the offspring would be a congenital one and such congenital morbid conditions would, according to biological law, be transmitted to the descendants of the said offspring. "Under such conditions," continued Dr. Reid, "a race afflicted by any disease would undergo rapid degeneration and ultimate extinction. We know that this is not the case." People differed in their susceptibility to the "charms" of alcohol; those who craved most strongly for alcohol were those whom alcohol affected most intensely and pleasurably. Moderate drinkers, on the other hand, did not have this craving. People drank, as a rule, in proportion to their desires. The greater the internal craving the greater was the temptation to excessive indulgence and the greater would be the mortality of such persons. Published statistics on parental alcoholism and on its effect on the offspring were untrustworthy because the various sources of error were not taken into account, and most observers were, continued Dr. Reid, prejudiced in favour of a preconceived theory. If the offspring of alcoholic parents were affected by degeneration then races or families which had long abused alcohol should be degenerating and tending towards extinction. The Jews, Greeks, Italians, Spaniards, Portuguese, and South Frenchmen, who as races had long been addicted to alcohol, should then *ex hypothesi* teem with degenerate and effete individuals the result of ancestral alcoholism. Yet the evidence was very clear that these races did not teem with such products and that they were at present the most temperate (and *ipso facto* non-degenerate) people on earth. Drunkenness in the ancestry was the cause of temperance among the descendants; hence the progeny of drunken parents tended, after the lapse of generations, to become temperate men and women with no craving for alcohol. Dr. Reid then briefly touched upon the use of opium in Eastern countries and concluded by enunciating the proposition that repressive legislation against alcoholism was useless among civilised nations. It had been tried on

hundreds of occasions during thousands of years and had universally failed except among the Mahomedans and with them success was only partial.

Dr. CHARLES A. MERCIER (London) referred to the enormous value of alcohol as a stimulant in states of exhaustion and as a hypnotic in many cases of insomnia. He did not believe in the possibility of correlating specific changes in the structure of the brain tissue with changes in consciousness, for how could the structural change, he argued, help us to understand why the patient in whose brain they occurred suffered from a delusion of persecution or a mnemonic delusion? No research into structural change would ever explain such phenomena. Dr. Mercier then proceeded to criticise at some length several of the propositions laid down by Dr. Reid. As regards the inheritance of acquired characters which Dr. Reid opposed he (Dr. Mercier) could, like all physicians experienced in mental disease, adduce numerous instances showing that alcoholism of the parents affected the offspring deleteriously, but he was aware that Dr. Reid evaded the consequence of such facts by stating that the morbid conditions seen in the offspring were not the result of alcoholism in the parents but were the outcome of other causes.

Dr. YELLOWLEES said that the effects of alcoholic indulgence varied especially with the temperament of the drinker. Some men never suffered from delirium tremens however long or deeply they drank, others became insane after but brief indulgence, others continued habitually "soaking" until the suspicions and hallucinations of chronic alcoholic insanity manifested themselves, while others did not manifest even these but sank gradually into chronic alcoholic dementia. He had noticed climacteric melancholia as a result of drinking habits indulged in early life—a heavy penalty paid for the errors of youth.

Dr. T. N. KELYNACK (London) referred to the importance of recognising the occurrence of auto-intoxication and to the remote and indirect "secondary infections" predisposed to by alcoholism. He thought that the morbid psychology of alcoholism would be a fit subject for collective investigation.

Dr. EDRIDGE-GREEN said that in discussing the transmission of acquired characters a distinction should be drawn between those characters which were acquired through the desire of the individual and those which were accidental, like the loss of an arm.

Dr. A. T. SCHOFIELD (London) thought that Dr. Reid had revived an old fatalistic theory which was believed to be dead. Tendencies to disease were inherited, but some tendencies of this nature might be resisted and overcome by hygiene and to this category belonged some of the evil tendencies transmitted to the offspring of alcoholic parents.

Dr. J. J. RIDGE (London) said that several of the links in a chain of argument might be correct though the conclusion might be absurd. Already life assurance societies were awakening to the fact that alcoholic indulgence, even in moderation, produced degeneration of tissues in the individual which showed itself at or about the age of 60 years.

Dr. FLASHMAN thought that the view held by some biologists that the germ plasma was uninfluenced by the environment could not be sustained on medical grounds. Changes in the nutrition of the body affected the blood plasma and the germ plasma. Dr. Reid neglected to take into account the many counteracting influences at work which mitigated the bad hereditary effects of parental disease, including parental alcoholism. He could not agree with Dr. Hyslop's statement that alcohol restored the nerve energy temporarily and he regarded the theory of ameboidism of the neurons as discredited.

Dr. FORD ROBERTSON said that he would go farther than Dr. Hyslop in attributing importance to the effects of alcohol in damaging the defensive forces of the body generally and locally and in thus opening up avenues for the invasion of bacteria. He regarded Dr. Reid's 16 propositions as bristling with fallacies. On general physiological grounds they were justified in regarding the germ cells as affected by nutritional conditions as other cells were. The onus of proof that the cells were unaffected by nutritional disturbances (alcohol and other toxic agents diffused in the blood plasma) lay with Dr. Reid. He awaited with confidence the further accumulation of evidence on this point, as he was convinced that alcohol affected the germ and sperm cells and was a potent factor tending towards the degeneration and death of the offspring thus affected.

Dr. ANDRIEZEN (London) said that alcohol acted on

the tired brain as a spur on a jaded horse. It did more damage to the nervous centres than simple fatigue would cause. It also deprived the tissue of the oxygen necessary for its metabolism. He had ample and indisputable evidence to prove that the "thorns" and "gemmules" of the cortical nerve cells, both human and animal, were normal structures. He referred to researches published by him in 1894 on alcoholic insanity in which a correlation was shown to exist between cerebral changes in the nerve cells and fibrils on the one hand and such clinical symptoms as muscular weakness and tremor, amnesia, and slowness of reaction time on the other. He believed that Dr. Reid's views were founded on a misconception of Weismann's theory of the so-called "isolation" of the germ plasma and adduced evidence from cases of idiocy and imbecility and from the investigation of the "Jukes" family showing that deep and far-reaching degeneration of descendants resulted from the alcoholism of parents.

Dr. HEYWOOD SMITH (London) had observed a characteristic symptom in female inebriates—viz., lying—and inquired whether it was common in cases of alcoholic insanity.

Dr. FLETCHER BEACH referred to a conjoint inquiry carried out by him with Dr. G. E. Shuttleworth a few years ago, as the result of which he concluded that idiocy and imbecility were common and frequent in the offspring of alcoholic parents. A man or woman who had "soaked" freely in alcohol for years could not be regarded as having sound and healthy germ cells or sperm cells. He believed that public opinion should be enlightened before repressive legislation was proposed, and when the morals of the nation were elevated there would be little need for such legislation.

Dr. WILFRED J. HARRIS (London) said that alcohol was not a strength-sustaining agent and was discarded by men training for swimming long distances or other feats of prolonged neuro-muscular work.

Mr. JAMES STEWART (Clifton) stated that in his experience nearly 40 per cent. of neurotic patients who had been under his care during recent years owed their disease to parental alcoholism.

The PRESIDENT, in summarising the subjects discussed, pointed out that the marked amnesia of chronic alcoholism, as well as the marked retardation of reaction time, were due to fine cerebral lesions affecting the cortical neurons. He could not accept Dr. Reid's view that alcohol did not prejudicially affect the germ plasma. As regards the right use of alcohol he felt that under the control of the reasoning and moral faculties the use of alcohol was in certain conditions advantageous.

Dr. HYSLOP and Dr. REID then briefly replied to the criticisms and comments made on their respective papers.

Dr. ALICE N. V. JOHNSON and Dr. GOODALL communicated a joint paper on

The Action of the Blood Serum from Cases of Mental Disease upon the Bacillus Coli Communis.

Starting from the view, now generally accepted, that excessive growth of intestinal bacteria might occur when the inhibitory action of the intestinal wall on bacteria was diminished, it was argued that excessive growth of the bacillus coli communis might especially be looked for in states of reduced health commonly associated with the progress of mental disease. Blood from 25 cases of insanity of various kinds was taken. Of these 11 were cases of acute mania, five were cases of melancholia, two of delusional insanity, one each of puerperal insanity, climacteric insanity, recurrent mania, and alcoholic insanity, and three were cases of general paralysis of the insane. Blood serum was prepared from each case and its action was tested upon cultures from mixed strains of the bacillus coli communis in order to ascertain whether, by the demonstration of agglutination, direct evidence could be adduced of the morbid influence of the said bacillus in such cases, or whether indirect evidence of the like nature could be obtained of the influence of other organisms related to the bacillus coli communis. The results of these experiments, which were cited in detail by Dr. Johnson, showed that agglutination was present in 60 per cent. of all the cases, such agglutination being good in 28 per cent. and only partial in 32 per cent. of the cases. Enumeration of the leucocytes was also practised in 13 cases of various forms of insanity, the blood being investigated once a week for a period of 14 weeks. The highest number of leucocytes was found in cases of acute mania, and in these and all other cases the leucocytes were found in largest numbers when

the patients were passing through acute states of insanity, the numbers falling to half or less during states of remission or of recovery. These experiments and observations tended to show that bacteria played an important part as toxic agents in the acute stages of some varieties of insanity and that leucocytosis was a valuable indication of states of exacerbation, of recovery, or of remission.

PATHOLOGY.

FRIDAY, JULY 31ST.

Mr. K. W. GOADBY (London) opened the proceedings with a demonstration and a short paper on

The Use of a System for keeping Records of Bacteriological Investigations.

He employed cards of two kinds: small ones for recording each investigation made and which formed a kind of journal and large ones on which the information gained from these was tabulated. This arrangement, as well as the tabular form printed on the cards, was the outcome of many trials. The cards were kept filed in drawers, were compact, easy for reference at any time, and cross references and comparisons were easily made. Guide cards of a different colour, blank, but with a projecting piece for a name, served to indicate groups of cards.

The PRESIDENT, Professor D. J. HAMILTON (Aberdeen), made some remarks in praise of the system and then as Dr. I. WALKER HALL (Manchester) was unavoidably absent his communication on

The Purin Bodies of Human Faeces in Health and Disease

was read by one of the secretaries of the section. Observations by various people had established the fact that nuclein was known to be excreted by the bowel. Only very slight traces of free purin bodies had been found and uric acid never. To determine the amount of faecal purin excreted by different individuals under varying conditions necessitated the maintenance of a fixed diet. The faeces were taken in periods of six days. By the process employed the total purin bodies were finally obtained as silver compounds. An aliquot portion was taken for estimation of the total purins and the remainder was subjected to a special process for the separation of the individual purin bases. Up to the present 40 studies had been made upon three individuals. They showed that upon the same diet, even at intervals of three and six months, the same individual excreted daily practically equal quantities of purin bodies in the faeces. These amounts were least upon a milk diet—i.e., purin-free food—and most upon a vegetable diet. The intermediary position was held by the mixed diet. When large doses of pure hypoxanthin and xanthin were added to the food the faecal purins were not increased. The administration of 0.5 gramme of guanin led in one subject to a marked increase—about 60 per cent. reappearing in the faeces. In another person guanin was better absorbed but still a large amount was excreted in the faeces. 500 grammes of pancreas gland caused an increased excretion of purin and only about 60 or 70 per cent. of the total quantity was absorbed. The quantitative separation of the faecal purins showed that guanin, adenin, xanthin, and hypoxanthin were always present. About one-half of the total quantity was represented by guanin, one-quarter by adenin, and about an eighth each by xanthin and hypoxanthin. It was probable that any guanin which occurred in a free state in the alimentary tract was oxidised to xanthin. In ordinary circumstances it was improbable that any of the food purins were voided by the faeces. When the dietary contained large amounts of nucleins, as, for instance, in sweetbread, it was possible that only a certain proportion was decomposed or absorbed and the remainder would appear in the faeces. The figures obtained suggested that there was a distinctly personal factor in the absorption of nuclein and its derivatives. There was little doubt that in experiments upon general metabolism the faecal purins should always be estimated, although from a clinical standpoint their slight variations might be neglected. An attempt to isolate nuclein from the faeces in a sufficiently pure condition for elementary analysis had so far not yielded successful results because of the difficulty of an entire removal of the mucin. The presence of guanin, adenin, xanthin, and hypoxanthin in the faecal nuclein suggested an origin from the cell nuclei of the intestinal mucous membrane, but it was possible that

the pancreatic juice might contain some free guanin. In diarrhoea and inflammatory conditions of the mucous membrane the purin bodies were increased. In a case of subacute rheumatism they had been unaltered in the acute attack, a subacute attack, and during convalescence six months later. In the normal adult the faecal purin yielded daily about from 0.01 to 0.023 gramme of nitrogen (from 0.025 to 0.0575 gramme of xanthins), a very small amount in comparison with the 0.16 gramme of nitrogen (0.58 gramme of uric acid and xanthins) passed in the urine on a purin-free diet. It was known that a small quantity of nucleo-albumin might be met with in the urine and that it arose from shed epithelium; similarly a certain amount of nucleo-albumin must be daily shed by the bronchial, pharyngeal, and nasal membranes. The remaining tissue cells passed their decomposed nuclein into circulating fluids of the body. It was obvious that in all inflammations the excretion of purin would be increased. Dr. Hall thought that these facts indicated the general absorptive and selective faculty of the intestinal epithelium of an individual whose factor had been attained and would assist in the determination of dietaries and therapeutic measures.

Professor SENATOR (Berlin) spoke a few words on the subject and then one of the secretaries read a paper on

A New Method for the Determination of Uric Acid in Urine,

by Dr. A. F. DIMMOCK (Harrogate) and Mr. F. W. BRANSON, F.I.C., F.C.S. (Leeds). They had devised the following method which had been found to work easily. 100 cubic centimetres of the urine were taken and warmed to about 40° C. and then saturated with 31 grammes of chloride of ammonium, the whole being well shaken in a stoppered measuring glass graduated in 100 cubic centimetres until complete solution of the chloride of ammonium was effected. The contents would then be at a temperature of about 15° C. and should be left for at least two hours (preferably 12) for the precipitate of urate of ammonium to subside. Should any of the precipitate have a tendency to remain near the surface a gentle rotation of the measuring glass would cause it to settle. The supernatant liquid was poured off and the portion left was to be carefully filtered through a small filter paper (diameter about 5.5 centimetres), as by Hopkins's method. The precipitate was carefully washed with a very dilute solution of ammonia, consisting of 1 part of strong solution of ammonia in 1000 parts of distilled water. The precipitate was best washed in the following manner. The liquid was allowed to drain from the precipitate and the filter paper was then filled with the dilute ammonia solution contained in a wash bottle. This was allowed to drain off and the filter paper was again filled with the ammonia solution. This operation was to be repeated a third time. Some of the filtrate was tested with a 5 per cent. solution of nitrate of silver acidulated with nitric acid 5 per cent. Only a very slight precipitate should be given, indicating the absence of any appreciable amount of chloride of ammonium, but if the filtrate still contained this salt it should be washed with a small additional amount of dilute ammonia. The precipitate with the filter paper was placed in the generating bottle of a special nitrometer, the tube being filled up to the mark (25 cubic centimetres) with the hypobromite solution and lowered into the bottle by a piece of string. The temperature of the hypobromite solution was noted; it should approximate to that of the room in which the estimation was to be made. The cork was now placed in the generating bottle and the bottle was plunged in a vessel of water of a temperature similar to that of the hypobromite solution. After two minutes the water level in the measuring burette was adjusted to zero and the apparatus was tested to see that there was no leakage. Finally, the generating bottle was tilted to allow the reagent to flow out of the tube and reaction between the hypobromite of sodium and urate of ammonium was promoted by shaking. After ten minutes the water levels were adjusted to equilibrium and the percentage of uric acid was read off as indicated by the nitrogen evolved. The burette used was graduated specially from the results of numerous determinations and the method seemed to be quite suitable for proportions of uric acid ranging from 1 in 1000 to 1 in 10,000. By the addition of a second scale to the burette the instrument could be used as a ureometer.

Dr. G. L. EASTES (London) remarked that the method appeared to be very satisfactory (if the graduations on the burette were to be relied on) in that it shortened the time taken in estimating uric acid by Hopkins's method by from four to six hours.

Dr. F. G. BUSHNELL (Plymouth) read the last paper on
The Differential Leucocyte Count and Estimation of the Leucocytes in 41 Cases,

including 20 cases of malignant disease, three of leukaemia, two of Hodgkin's disease, two of beri-beri, one of blackwater fever, one of malaria, one of (?) Addison's disease, and one of hypertrophic cirrhosis of the liver. Besides the paper giving Dr. Bushnell's remarks on the cases a table was added containing details of the blood counts.

Dr. E. R. CARLING (London), in the course of some remarks on this paper, stated in regard to a series of cases of appendicitis in which he had counted the leucocytes that in those cases where the leucocyte count had amounted to 20,000 per cubic millimetre pus was found at some time or other either before or after, but that pus was not found in any of those cases in which the leucocytes were less than 20,000 per cubic millimetre.

After some concluding words by the PRESIDENT of the section the meeting came to an end.

In addition to the papers, discussions, and lantern demonstration the section provided a pathological museum containing more than 120 macroscopic pathological specimens, many of them of very great interest, which were lent from various institutions or by private individuals, besides a valuable series of radiograms, photographs, and drawings of pathological conditions and about 30 microscopic specimens. Dr. D. E. EVANS (Swansea) and Dr. NEWMAN NEILD (Bristol) were responsible for the excellent arrangement of the museum.

OPHTHALMOLOGY.

FRIDAY, JULY 31ST.

Mr. GUSTAVUS HARTRIDGE (London) opened a discussion on

The Treatment of Convergent Squint.

He said that the treatment of concomitant convergent strabismus in a scientific manner could only be approached by the consideration of the various factors which helped to produce the disorder and by a careful examination of every case so that the value and importance of each factor might be ascertained. It was known to all that concomitant convergent strabismus was a condition affecting both eyes, a binocular defect, and the result of excessive innervation of the internal recti muscles excited by the associated act of accommodation. The factors which assisted in the production of squint were: (1) hypermetropia; (2) imperfect development of the fusion faculty; (3) defective visual acuity in one eye; and (4) the anatomical position of rest of the eyes. These various factors did not play the same part in every case; they might not all be present, hence a careful and systematic examination of each case was essential. The objects to be obtained by treatment were: (1) the correction of the deformity; and (2) establishment of binocular vision for all distances. He divided the treatment into three classes: optical, orthoptic, and operative. The importance of an exact optical correction was beyond all question and in many cases resulted in a complete cure. Orthoptic exercises were of great value in many cases but must be commenced early. They consisted of: (1) covering up the fixing eye for a certain time daily; (2) practice with a stereoscope or one of the special instruments devised for this purpose, such as Mr. Priestley Smith's "heteroscope" or Mr. C. A. Worth's "amblyoscope"; and (3) bar reading. The optical and orthoptic treatment must be faithfully carried out for 12 months before any operative treatment could be entertained. When an operation had been decided upon they had to decide what operation should be undertaken. They had at their disposal four operations: (1) simple tenotomy of one or both eyes; (2) simple advancement; (3) tenotomy with advance of the opponent muscle; and (4) stretching of one of the muscles. The chief points on which he invited discussion were: (1) when was an operation necessary or justifiable? and (2) what operation gave the best results? In his view the conjunction of tenotomy of one muscle with advancement of the other gave the best results; he was distinctly adverse to operating on both eyes at the same sitting. As to the age for operation, that must be determined by the condition of the field of vision in the divergent eye. They had always to bear in mind the deformities produced by operation, sunken caruncle, limitation of movement, alteration of width of palpebral fissure, and the like; each case had to be considered in view of these after-effects. They had also to bear in mind that squints

did disappear in time, though at the cost of amblyopia of the one eye.

Mr. CLAUD A. WORTH (London), who had given notice of reading a paper entitled "Methods of Preserving or Restoring the Vision of the Deviating Eye and Developing the Fusion Sense," read the paper as a contribution to the discussion. He laid stress on the necessity of exact optical correction in squint cases; in his experience no child was too young for glasses; in exceptional cases he had found them tolerated at as early an age as three months; of course, under such conditions special precautions had to be taken in the fitting of the frames. His experience had convinced him that amblyopia pure and simple was the result of disuse and that the loss of vision could be recovered from by proper training. It was essential to begin early and to make the exercises attractive. This he thought he had attained in the device of his "amblyoscope." The object of fusion training was not to cure the squint, though this in exceptional cases might result directly, but it was directed to the revival of the suppressed vision of the deviating eye. In 193 cases of convergent squint which had lasted one-eighth of the children's lives he obtained after treatment 165 cases of perfect vision; in no case was the power of fixation lost. As regards operation, if the fusion was rapidly developed he had no hesitation in operating early, so that the growth of the fusion sense was fostered by the renewal of the proper balance of the muscles; in such cases there was little or no danger of secondary deviations.

Mr. J. TATHAM THOMPSON (Cardiff) agreed with Mr. Worth that the sooner optical correction could be given the better for the deviating eye; he had, however, never had the opportunity of giving glasses at an earlier age than about two years. He had not had much experience of fusion tubes but had found stereoscopes of little use. As regards the nature of the best operative treatment, he thought the frequency of performance of simple tenotomy had declined, yet in some cases it was a justifiable procedure and the results were satisfactory. He did not think it wise to operate on both eyes at one sitting; it was preferable to keep the sound eye in reserve until the effects of the interference with the deviating eye had been observed. After seeing Professor Landolt operate in Paris he had become a thorough believer in the method of advancement by splitting the tendon; he never removed any part of the tendon. He thought highly of Mr. Worth's method of diminishing the use of the sound eye by the long-continued instillation of atropine so as to compel the deviating eye to be exercised for near vision; it enabled the weak eye to be exercised without dependence on nurses and teachers.

Dr. E. E. MADDOX (Bournemouth) said that he agreed with both Mr. Hartridge and Mr. Worth in their general enunciations. He had not had much opportunity for the practice of orthoptic training except in the rather later ages when the results obtained were not brilliant.

Mr. N. BISHOP HARMAN (London) drew attention to a remarkable instance of anticipation of their present knowledge of the development of the fusion faculty in young children. Pepys in his famous "Diary" recorded a talk with the doctor of the ship which brought Charles II. from his exile; the doctor informed him "that children when they are young do use their eyes severally to look in any direction, but as they grow they learn to use them so that they have but one eye." Mr. Harman thought that they could not over-estimate the importance of the proper recognition of the fact that the attainment of binocular vision both in the individual and in man as one of the higher animals was of recent date. Comparative anatomy had shown that lately developed organs and faculties were those most easily lost in adverse circumstances. And in some eyes almost trifling errors of refraction or opacities in the refracting media easily destroyed the recently acquired and delicate balance of binocular vision.

Dr. A. DARIER (Paris) said that he did not believe in congenital amblyopia, except in circumstances of damage to the fundus oculi; he thought it was due to an avoidable suppression of vision. It was his practice never to operate on two eyes at one time. As regards the preference for tenotomy or advancement, he pointed out that the eyes in these cases of squint were often of odd sizes, the converging eye being usually the smaller; in such circumstances it was a positive advantage to produce an increase in the width of the palpebral fissure and so enhance the apparent size of the eye by the operation of tenotomy.

Dr. R. A. REEVE (Toronto) agreed in the importance of

early treatment; the baby patient seemed to appreciate the improved vision afforded by glasses. He never operated before the age of six years and only on one eye at a time. He drew attention to the importance of accurate adjustment of the advanced muscle in view of the frequent production of hyperphoria by ordinary methods. He strongly recommended the method of tucking the redundant piece of tendon under its insertion and not cutting it at all.

Mr. F. M. GRANGER (Chester) concurred in these observations.

The PRESIDENT (Mr. H. E. JULER, London) said that the emphasis of the discussion lay in the recognition of the need for the development of the dormant fusion faculty in the subjects of squint. His views of the possibility of the accomplishment of this had become much more hopeful since he had read Mr. Worth's recent book on the subject. There was no doubt that the failure to get good results arose from the neglect to take the cases sufficiently early. His experience of the temporary repression of the acuity of the sound eye by the instillation of atropine into that eye alone was excellent. As regards operative treatment, the practice of simple tenotomy was not to be wholly condemned; in some cases it was a very simple and most excellent operation. In looking over his old cases where even double tenotomy had been practised he found very good results. There was doubtless some loss of convergence, yet there was sufficient for all ordinary needs. The practice of simple advancement had the countervailing disadvantage of producing enophthalmos.

Mr. W. T. LISTER (London) questioned the advantage of early operation in these cases. Advancement needed general anaesthesia for its performance in young subjects and it was not possible to be sure of a good adjustment when the eyes were wandering under the influence of the anaesthetic.

Mr. HARTRIDGE, in replying, said that he had never given glasses so early as Mr. Worth; he thought one year old to be the earliest age advisable. He agreed that the use of atropine in the sound eye alone presented much advantage. The methods of splitting the muscle or of folding the redundant tendon he had tried.

Mr. WORTH also replied.

Mr. THOMPSON read a paper on

The Fixation of the Eyeball during Operation.

He pointed out the tendency of the eyes to turn upwards under cover of the upper lids so that there was a direct opposition to the downward traction of the fixation forceps. This tended to produce gaping of the corneal incisions. He had found great benefit by fixing the eye by means of two silk sutures applied over the sites of the internal and external recti; by the manipulation of these "reins" the movements of the globe could be completely controlled without any tendency to an increase of tension or a distortion in the anterior segment of the globe, so that sections here did not gape.

Mr. W. M. BEAUMONT (Bath) pointed out that he had devised a two-pronged fixation forceps with this idea in view; it was made by Messrs. Down.

Mr. H. C. ENSOR (Cardiff) narrated a case in which he had practised

A New Operation for Congenital Ptosis.

The case was that of a young girl with unilateral ptosis of marked degree. He had incised the tissues of the upper lid to the periosteum of the frontal bone; then by the use of the cautery he had produced scarring and adhesion of the tissues of the lid to the periosteum. After this procedure the lid was found to be satisfactorily suspended, whilst the eye could be closed by the upward movement of the lower lid.

Mr. THOMPSON said that he had seen the case referred to; the lid was distinctly elevated, but he feared there would be undue exposure of the globe during sleep.

Major H. HERBERT, I.M.S., made a communication in regard to

The Pathology of Spring Catarrh,

illustrated by microscopic sections. He described a hitherto unnoted eosinophile infiltration of the tissues and the presence of minute vesicles in the epithelial layers of the pedunculated growths which were also filled with the eosinophile cells. He further noted that in the examination of the blood of the subjects of this complaint there was an increase in the eosinophile count of from 10 to 20 per cent, but he added that it was not certain whether this might not be due to the presence of the grosser blood parasites with which the patients were infested.

Mr. DEVEREUX MARSHALL (London) said the observation of the eosinophile condition of the blood in cases of spring catarrh was of interest; if it could be substantiated for all cases it would provide a certain mode of differentiating a rather obscure condition.

Major HERBERT also made a further communication on the subject of the

Superficial Punctate Keratitis of Bombay.

He said that since his earlier communications on the subject he had come to the conclusion that the affection was endemic in Bombay; it was most prevalent after the rains in warm weather; the association of conjunctivitis with the condition was marked. In some film preparations of scrapings of the cornea he had been able to demonstrate an organism, probably an encapsuled bacillus; the observation was difficult to follow out since the organism could not be cultivated.

Dr. ADOLPH BRONNER (Bradford) described a

Modified Mules's Glass Ball for Use after Removal of the Eyeball.

He remarked that the ordinary Mules's globe in some cases worked its way out from between the muscle stumps. He had had globes prepared with tunnels stretching from the poles; by this means he was able to connect sutures passing through the tunnels of the globe with the sutures securing the stumps of the muscles. He considered that he obtained a more mobile and prominent stump.

Mr. N. BISHOP HARMAN (London) read a paper on

Knee jerk Phenomenon in Interstitial Keratitis.

He said that his attention had been directed to the subject by some remarks on a case shown at a meeting of the Ophthalmological Society last year. A paper giving an earlier investigation had been published in the Ophthalmic Hospital Reports of 1888. The authors of that paper examined 62 cases and arrived at the following conclusions: (1) that in 30 per cent. the knee-jerks were distinctly diminished; (2) that in 10 per cent. the jerk was absent; and (3) that the jerk was rarely if ever exaggerated. Mr. Harman described the mode of making the examination which he had adopted; he considered this mode enabled him to get rid of the personal equation in great measure, it afforded a standard scheme of varieties, so that results could be checked by others. In all he had examined 100 cases, many of them on several occasions; and as a means of comparison 100 healthy individuals of similar age and sex had been examined. On comparing the results obtained it was found that the condition of the reaction in the subjects of congenital syphilis and in health was almost identical. On general grounds he pointed out that this was what might be expected. In acquired syphilis it was probable that, as in other general conditions—e.g., starvation—the tissues were affected unequally, and the higher nerve centres latest; until such time the conducting paths, which would exhibit a diminished resistance and reparative power, would be subject to the strain of active and perhaps exaggerated cerebation and tend to degenerate (tabes dorsalis). On the other hand, in congenital syphilis the whole system, higher and lower centres, was developed under the continuous influence of the poison; it was therefore unlikely that with the feeble cerebation of a more or less degenerate brain the conducting paths would be subject to strain. He thought this argument accounted for the fact that tabes dorsalis was the common result of nerve changes in acquired syphilis and mental degeneracy that in congenital syphilis.

Mr. R. W. DOYNE (Oxford) said the question interested him considerably, as he had recently examined the knee-jerks in a series of 32 cases of congenital syphilis. In the majority the reaction was normal, in no case was it absent, though there were a few in which reinforcement was necessary.

Mr. BEAUMONT said he also had in the last few months undertaken a similar investigation; he had examined 15 cases in each of which the knee-jerk was normal.

Mr. HARMAN also read a paper on

An Improved Method of Operation for the Relief of Ptosis Palpebræ.

Present methods might be summed up under three groups: (1) attachment of the drooped lid to the superior rectus (Métais), in some respects an ideal proceeding but one which commonly failed by producing diplopia and leaving the globe exposed when upturned in sleep; (2) plastic operations such as that of Panas which had the disadvantage that in the

not uncommon event of failure scars were added to the patients' already marred features; and (3) the provision of an artificial fronto-palpebral elevator by attaching the frontalis muscle to the lid margin by a wire, the device of Mules. This was the most practicable method, but it had the objections of requiring the splitting of the lid margin, causing a permanent stiffening of the lid so that it could not be subsequently everted, leaving an irritating knot above the brow, and the wire being smooth and unsociable remained a foreign body and liable to expulsion. Mr. Harman had overcome these objections by the adoption of a fine gold chain of great strength, slenderness, and flexibility. The operation gave rise to no other damage to the tissues than that of the needle punctures. He relied for fixity of the loop by burying deeply lengths of the chain above and parallel to the brow. He believed the growth of connective tissue around and within the links of the chain would foster the production of a veritable connective tissue tendon so that the artificial support of the chain would be of secondary importance. In placing the chain in position it was attached to a "triangular four inch needle" by a soldered link or a knotless silk loop; the method of emplacement can be followed by reference to the diagram.

There were on exhibition a series of specimens of Pathological Conditions of the Eye by the PRESIDENT; a number of drawings of the Fundus Oculi in Tuberculous Choroiditis by Mr. SYDNEY STEPHENSON; and some Instruments for Clinical Observation—a Simple Perimeter in large and portable models, a Refractometer, and a Scotometer—by Mr. BISHOP HARMAN.

DISEASES OF CHILDREN.

FRIDAY, JULY 31ST.

Dr. G. CARPENTER (London) read a paper on

A Case of Syphilitic Nephritis in an Infant aged Five Months.

Both parents had been syphilitic. The patient was the fourth child and had been born at the eighth month. The infant soon developed many of the typical signs of inherited syphilis. Soon after admission the urine was found to be very little in quantity and contained a considerable amount of albumin. The child died. The kidneys were found to be in a condition of catarrhal nephritis by microscopic examination and there were no interstitial changes. It would therefore seem that catarrhal conditions in the renal tissue could arise from the syphilitic poison.

Discussion on Tuberculosis in Children and its Relationship to Bovine Tuberculosis.

Dr. NATHAN RAW (Liverpool) stated that he agreed with Koch that human and bovine tuberculosis were distinct diseases, although a similar bacillus was found in each. He believed strongly that bovine tubercle could be transmitted to man, although human tubercle could not be conveyed to cattle. He considered that nearly every case of pulmonary tuberculosis was due to direct infection from man to man but that many instances of abdominal tuberculosis in young subjects were in reality due to infection with bovine tubercle. The post-mortem appearances in both young infants and calves dead from tubercle were also identical. In tabes mesenterica he believed that every case would show that the child had been fed for some time on cow's milk. It would seem that although pulmonary tuberculosis in adults was on the decrease in England tubercle of the abdomen in young subjects had distinctly increased; also that tuberculosis in English cattle was on

the increase according to the statements of competent veterinary surgeons. As a rule infection probably occurred from bovine tubercle bacilli passing through the intestinal wall. Then the mesenteric glands became affected and afterwards the retroperitoneal glands. When these cases were examined bacteriologically it would be found that although the actual bacillus appeared to be the same as that which was present in the pulmonary tubercle of adults, yet the culture growth was quite different. The growth corresponded exactly with that from bovine tubercle and was entirely distinct from that which was derived from human tubercle. With regard to the tuberculosis of cervical glands in children, again he thought that they depended upon an infection with bovine tubercle through the tonsils and the naso-pharynx. It would appear likely that the bovine tubercle bacillus was very virulent so far as young subjects were concerned, but that it had but little action upon adults and that the tubercle bacillus of the adult human being was not so virulent to children. Further, it might be that an infection with the bovine organism protected from future infection with the human bacterium. In cases of tuberculous meningitis he was sure that there might be the meningeal condition without any other signs of tubercle and he considered that there might have been direct infection of the meninges through bacilli having gained entrance from the pharynx into the blood stream.

The PRESIDENT (Mr. W. ARBUTHNOT LANE, London) congratulated Dr. Raw on the clear manner in which he had stated his conclusions. He thought that in many cases of tubercle in children, including tuberculous meningitis, there had been a previous traumatism, for it was rare for the bacillus to infect wholly healthy organs. Glands in the neck might first have been infected with some other bacterium and then with the tubercle bacillus. In abdominal tuberculosis again there was usually a previous history of intestinal disturbance.

Dr. D. A. REID (Tenby) considered that it was the duty of every medical man to render all the aid in his power to the elucidation of the question of infection. He drew attention to the fact that the natives of India and even their children were peculiarly free from tubercle, while European residents there and their offspring were very liable to the disease and he believed that this was due to the fact that the native eschewed beef and cow's milk and only partook of goat's milk, the goat, perhaps, being the animal least likely to be attacked with tubercle.

Mr. JOHN MACKENZIE (Kirkby-in-Ashfield) had seen one case of tuberculous disease of the nipple in a woman, but she did not give her offspring tubercle. He considered that most cases of tuberculous meningitis were preceded by disease of the middle ear.

Dr. THEODORE FISHER (Bristol) thought that the reason why children suffered so much more than adults from tuberculous glands in the neck was not that they were more susceptible to bovine tubercle but because all adenoid tissue in the young was very prone to be inflamed. Again, he believed that abdominal tubercle might arise from a bronchial infection, for the secretions, in the tubes might swarm with tubercle bacilli. He did not believe in the ascending spread from the abdominal to the thoracic cavity.

Mr. C. G. HIGGINSON (Birmingham) stated that experiments on human subjects with bovine virus were constantly being made, for much milk drunk was tuberculous. Dr. Raw had again put the profession on its guard against milk and, he considered, rightly so.

Dr. W. L. SYMES (Dublin) did not like the term "tabes mesenterica." He considered that there were three varieties of abdominal tuberculosis: one in which the peritoneum alone was involved; the second in which only the mucous membrane of the bowel was diseased; and the third—a rare form—in which the mesenteric glands alone were affected. This last was the only one that deserved the term of "tabes."

Dr. E. CAUTLEY (London) admitted that he believed that bovine tuberculosis might occur in children, but he was sure that it was very rare and that infection with human virus was much more common. He considered that the expression "tabes mesenterica" should be dropped at once. He believed that tubercle in cattle was not so frequent as was thought. He considered that the bulk of it was found in pedigree cattle and those kept in towns. He was sure that the bronchial glands were even more frequently infected than the abdominal glands. Acute tuberculosis was rare in children except when it occurred in the lungs. He thought

that condensed milk as an article of diet tended to make children susceptible to tubercle.

Dr. CARPENTER (London) said that he had seen cases of so-called "tabes mesenterica" in children who had been fed entirely upon breast milk.

Mr. W. MCADAM ECCLES (London) expressed his conviction that a large number of cases of tubercle in children were the outcome of a primary infection with another organism which paved the way for the tubercle bacillus. This was particularly so in the case of the cervical glands.

Dr. RAW, in his reply, referred to the very complex nature of the subject and reaffirmed his conviction that there were many cases in which the tuberculous infection spread from the abdomen to the thorax. With regard to Swiss condensed milk, it must be remembered that until lately this in itself was a source of infection in all probability, containing as it did some years ago many tubercle bacilli of the bovine form.

Adenoid Vegetations in Infancy.

Mr. R. C. DUN (Liverpool) wished to draw attention to the possible existence of adenoids during the first year of life. Some instances would appear to be truly congenital, symptoms referable to the condition being present at birth. He believed that a considerable number of infants suffered from a slight degree of adenoid vegetations, as evidenced by mild symptoms of nasal obstruction and catarrh. But there were also not a few cases in which more severe and even grave symptoms might be present. These would materially interfere with the health of the infant and did not tend to improve with ordinary medical treatment. There were several forms of the affection: the first in which there were marked nasal obstruction and catarrh, with or without epistaxis; the second in which reflex nervous phenomena were the principal manifestations of the trouble, without any real nasal obstruction (such signs might be convulsions, laryngeal stridor, and vomiting); the third those in which secondary septic affections predominated, these being chiefly septic adenitis and otitis media; and, lastly, those cases in which nasal obstruction was present and was associated with nervous and septic conditions. In by far the larger number of cases of adenoids in infancy the symptoms were slight and did not call for active operative treatment, but, on the other hand, there were certainly some cases, comparatively few in number, in which the signs and symptoms were such as to demand removal of the adenoid growth. In these the improvement that followed operation tended to confirm the fact that the various phenomena that the infant presented were in reality due to the lesion in the naso-pharynx.

LARYNGOLOGY AND OTOTOLOGY.

WEDNESDAY, JULY 29TH.

Sir FELIX SEMON (London), in introducing the discussion on

The Operative Treatment for Malignant Disease of the Larynx,

gave a historical retrospect, first referring to the period of therapeutic nihilism, then to Czerny's experiments and to the first operations. The mortality attending the first thyrotomies led to destructive criticism, and Paul Bruns in 1879 condemned the operation. The diagnosis in those days was imperfect and so was the technique. Butlin reinstated thyrotomy in 1889 and with better means of early diagnosis and improved technique of the operation good results followed, so that in the present day if a case remained cured after one year had elapsed since the date of the operation the patient was in the same position, so far as the disease was concerned, as if he had never had malignant disease of the larynx. Sir Felix Semon reminded his listeners of the dangers of statistics. Collected statistics from various observers and various operators at different periods gave rise to erroneous conclusions. The statistics of individual observers were alone trustworthy. He said at the present time that there were five different operations at their disposal. 1. The intra-laryngeal method. Its field of usefulness was extremely limited. It was conceivable that when the disease was limited to the epiglottis it might be removed by this method, but the endolaryngeal operation had its drawbacks and was generally unsuitable in malignant disease. 2. Thyrotomy, with or without the removal of smaller fragments of cartilages. This, in the speaker's opinion and experience, was in suitable cases a perfectly ideal operation.

3. Partial extirpation of the larynx. 4. Total extirpation of the larynx. The recent improvements in its technique had increased the legitimacy of this operation in desperate cases. 5. Subhyoid pharyngotomy was of limited applicability. Speaking of the difficulties in diagnosis he said that cases of malignant disease of the larynx might be classified under three heads: Firstly, those in which everyone could make the diagnosis; secondly, those in which only experts could make the diagnosis; and thirdly, those in which no one could make the diagnosis. He advised the removal of a piece of the growth by the endolaryngeal method for a pre-microscopic examination, but when in doubt about the diagnosis their duty was to treat the case as one of malignant disease.

Dr. E. J. MOURE (Bordeaux) through illness in his family was unfortunately prevented from being present to take part in the introduction of the discussion.

Professor TH. GLUCK (Berlin) made an exhaustive communication upon the operations for malignant disease of the larynx and adjacent structures. He dealt mainly with the operations for the partial and total extirpation of the organ. After referring to the works of the pioneers in this branch of surgery he briefly described his manner of operating for the relief of stenosis and cicatrization of the trachea and larynx, and passed to a consideration of thyrotomy and laryngotomy for diffuse papillomata and circumscribed cancer of the vocal cord as well as operations for the loss of substance caused by exfoliative necrosis of the laryngeal cartilages. In connexion with the operations he had performed for the eradication of cancer in this region he had successfully extirpated the pharynx, the larynx, the œsophagus, the entire thyroid gland, the vagus nerve, the cervical portion of the carotid and jugular vessels, and had obtained cures of two and a half years' duration. The mortality following operations for extirpation of the larynx hitherto had been due to septic broncho-pneumonia. To combat this he performed a prophylactic resection of the trachea by which a wall of tissue—a living impermeable diaphragm—was interposed between the cavity and wound of the operation and the lungs, which rendered aspiration of foreign bodies into the lungs impossible, the trachea being shut off from the pharynx and œsophagus. In hemilaryngectomy, laryngotomy, and total extirpation of the epiglottis a plastic operation, based on the same principle, was performed. After healing of the wounds the patients could partake of food like normal individuals. The duration of development of cancer of the larynx and pharynx might be even some years before the symptoms were sufficiently marked to bring the disease under notice; on the other hand, the duration owing to hæmorrhages or hoarseness might be very short. An early diagnosis and a radical operation were the essentials for recovery. Diabetes, heart disease, or advanced age did not form absolute contra-indications for operations. Amongst the complications arising from the operations for extirpation of the larynx were uncontrollable hæmorrhage from the bowels; hemiplegia, or perhaps loss of consciousness and death following ligation of the carotid artery; rise of temperature and pulse-rate which might be due to sepsis, iodoform poisoning, or heart failure; bronchitis; embolism; phlegmon of the posterior wall of the trachea and of the mediastinum; and myxœdema. Professor Gluck indicated how these possible complications might be anticipated or combated. Speaking of the results obtained from the various operations which he had performed for carcinoma of the larynx and pharynx, he said that in four cases the vocal cords had been extirpated by laryngo-fissure with excellent results, the patients remaining well for six months and two and a half, three and a half, and four years, respectively. Hemilaryngectomy had been performed in 35 cases with only three deaths, one after 24 days from sudden heart failure, another independently of the operation from a phlegmon of the right gluteal muscle, and the third from pneumonia on the fifth day. From amongst a series of 22 cases of total extirpation, there had been only one death and that on the eleventh day from iodoform poisoning in an old man, aged 70 years. Amongst the 27 transverse extirpations of the larynx and pharynx, mostly with glandular extirpation also, there had been only one death. These results compared with a previous series of cases marked brilliant progress. In a former series of nine cases—certainly very serious cases—there had been four deaths, and going back to 1888 and the first cases there had been only two recoveries out of ten operations. The operation lengthened life,

renewed hope, and if after a year, or a year and a half in the more desperate cases, relapses occurred, then according to the speaker's experience the end was less painful to the patients, and in the interval the patients had lived contentedly, and in some cases merrily, till the relapse brought death rapidly. Professor Gluck said that he could have brought forward 38 of his patients, some of whom had survived the operation 11, 8, 6½, 5½, 4½, and 3½ years and in full health. Others had died from other illnesses and not from recurrence of the disease. In consequence of the length of the journey he had brought only two with him; both had been the subjects of cancer of the larynx and pharynx. In the one case five years and in the other three months had elapsed since the operation. The older case had been twice radically operated upon, with total extirpation, resection of the pharynx, the great vessels of the neck, and the vagus nerve; the patient spoke with a pharyngeal voice and followed his calling of a farmer. The second spoke with the nasal-phonetic apparatus which had been devised by Professor Gluck and which was demonstrated. Professor Gluck detailed and demonstrated by means of diagrams the various stages of the operations he had spoken of and also demonstrated a series of laryngeal and cancerous growths he had extirpated. The majority of the individuals to whom the organs and growths belonged were alive and well.

Dr. HERBERT TILLEY (London) referred to some points in the technique of the operation. For checking the oozing from the wounded parts in the larynx he had found Whitehead's varnish a most excellent antiseptic and styptic. He had observed subsequently to the operation small granulations in the anterior commissure at first suggesting a recurrence, but which were due to the stitches used in closing the cartilage.

Dr. W. JOHNSON HORNE (London), speaking from a pathological as well as from a clinical experience, considered that when an error was made in diagnosis it was more commonly on the side of regarding an innocent growth as malignant than a malignant growth as innocent. An early diagnosis was of the utmost importance, but too much value might be attached to the information to be derived from a bit of the growth removed by the endolaryngeal method for microscopic examination. A negative result from such an examination was to the case what a negative result from an examination of the sputum was to a doubtful case of pulmonary tuberculosis. He thought it better not to disturb the growth by the endolaryngeal removal of a portion without first obtaining consent to a laryngo-fissure if deemed to be advisable, and in doubtful cases he considered laryngo-fissure should be resorted to.

Mr. R. H. WOODS (Dublin) was in favour of suturing the cartilages after thyrotomy; in his experience granulations within the larynx had not followed. He was opposed to the use of Whitehead's varnish; there was the danger of œdema following owing to the surface which it closed not being absolutely aseptic. The proper preparation of the patient he held to be a factor in preventing sepsis.

Dr. E. S. YONGE (Manchester) communicated the notes of two cases of epithelioma of the larynx remaining well two years after operation (thyrotomy).

Dr. J. DUNDAS GRANT (London) referred to the possibility of the fragment removed for microscopic examination containing no malignant growth, and to the frequency with which the disease was found on thyrotomy to be much more extensive than the laryngoscope had indicated. He thought that cases in which, before operation, there was a tendency to the regurgitation of fluids into the larynx were less favourable in their prognosis than those in which that did not exist, as there was every probability of the occurrence of "swallowing pneumonia."

Mr. C. P. CHILDE (Portsmouth) spoke of sudden death following the operation for cancer of the larynx in alcoholics.

The PRESIDENT (Dr. P. W. WILLIAMS, Bristol) congratulated the section upon the excellent discussion and expressed himself in accord with the views about the value of a pre-microscopic examination and statistics.

Sir FELIX SEMON and Professor GLUCK replied to the several points raised. Sir Felix Semon advised food from the first through the mouth; and preferred cocaine to any other styptic for arresting bleeding within the larynx. After thyrotomy he sutured the cartilages, taking care to pass the sutures through only the superficial part and not to enter the larynx.

TROPICAL DISEASES.

WEDNESDAY, JULY 29TH.

The PRESIDENT (Dr. GEORGE H. F. NUTTALL of Cambridge) in his introductory remarks referred to the importance of the study of tropical medicine and congratulated the British Medical Association upon its decision to hold a section devoted to tropical diseases at its annual meetings. He could not regard any medical conference as complete in which the study of tropical ailments did not find a place. In no department of medicine was a larger field of inquiry open and in no department had more important work been accomplished during the past few years. He stated that in temperate and tropical climates many parasites existed having a similar life-history and the study of several of the parasites met with in temperate climates served to elucidate and to advance their knowledge of parasites which had hitherto been looked upon as peculiarly tropical. Their knowledge of mosquitoes had been advanced by work conducted in laboratories in England and as a further example he mentioned that he had found a filaria (von Linstow) in the head of stomoxys calcitrans in England and apparently the larval forms present in the blood of cattle. In well-appointed laboratories in England investigation could be carried out more readily than under the unfavourable conditions usually present in the more remote parts of the empire.

Three papers dealing with the disposal of sewage in the tropics were communicated.

Dr. W. J. R. SIMPSON (London) opened the discussion by reading a paper on

The Disposal of Excreta in the Tropics

and drew attention to the fact that in dealing with the question of sewage in the tropics they had to consider not only its final disposal but also its collection, removal, and purification. His recent experience in China had shown him that perhaps of all peoples the Chinese were the most careful in the collection and disposal of their excreta. They were not sanitary but commercial reasons which determined the disposal, as all excreta were marketable commodities for the manurial value which they possessed. A proof that it was not hygienic reasons that induced the Chinaman to dispose so carefully of all excreta was the manner in which he dealt with garbage and house refuse. These were thrown about his dwelling causing a foul environment. A further lesson to be learned from the Chinaman was the fact that he did not scatter fresh excreta on the soil but stored them in barrels or cesspools adjacent to the garden or farm for some time before using them. In this way the excreta underwent bacterial changes similar to those which they knew of in the septic tank recently introduced in England. He held that the land should be the final destination of all excreta in the tropics and the method of conveying them thither was the problem. In quite small villages the pail system would serve; in larger villages public latrines in convenient places over raised and well-cemented cesspools, protected from flood water, were indicated; but in small towns of, say, from 10,000 to 15,000 inhabitants a system of pipes to remove the excreta would appear to be necessary. For such towns a pail system so arranged that the sewage could be emptied into conveniently placed dépôts in different parts of the town and a system of pipes conveying the contents of the cesspools to proper outfalls would seem requisite. In large cities, such as Bombay, Calcutta, &c., with an outfall to the sea, a water-carriage system presented, perhaps, the best method of disposal, but in an agricultural population the habits of the people had to be considered and any disposal of excreta, &c., must be accomplished in a manner which recommended itself to the custom of the inhabitants. Dr. Simpson was against the wholesale introduction of European methods in Oriental countries. He considered it better to improve the existing methods rather than to introduce something totally new; he therefore considered the pail and cesspool system with pipes leading to an outfall in fair-sized towns as most suitable. The disposal of the sewage on the soil was usually accomplished by burying in trenches and cultivating the soil over them. They must not be too deep—certainly under two feet. In dry countries the trench method of disposal must be combined with some form of irrigation and in wet countries it seemed best to store the excreta in cesspools during the wet weather, letting the contents run off in trenches when the wet season

was over. In all disposal of sewage by pails, carts, &c., the chief difficulty was to keep the utensils clean and means of cleaning these must be provided at the dépôts. He had never been able to trace disease to a properly conducted trenching ground, while swarms of flies over a trenching ground indicated that it was not being properly managed.

Lieutenant-Colonel ANDREW DUNCAN, I.M.S. (retired), also read a paper on the same subject and advocated for the tropics the system recommended in Poore's "Rural Hygiene." He had seen this tried in India with excellent results by Colonel Hamilton, I.M.S., the excreta being buried in shallow trenches in the hospital compound and the soil cultivated. The excreta must not be buried too deeply nor any antiseptic used; it was dangerous, however, to allow of too light a covering as the birds were apt to scratch the earth away. Earth closets were to be recommended, the earth being previously sifted and stored but not artificially dried. The surface layers of the soil should be used for the earth closets, for when taken from too deep a pit the earth was comparatively sterile.

Captain LEONARD ROGERS, I.M.S., contributed a paper entitled

The Influence of the Septic Tank on Pathogenic Bacteria.

In carrying out a series of experiments in connexion with this subject he separated the organisms present in the septic tank effluent from the fluid in which they lived and tested the action of the sterile effluent on various pathogenic bacteria under anaerobic conditions in order to see how far the chemical conditions were injurious to the added organisms. The following pathogenic germs were experimented with: typhoid fever, cholera, anthrax, staphylococcus, streptococcus, micrococcus melitensis, dysentery, and plague. So far the results tended to show that the septic tank process was inimical to most of the pathogenic organisms tested, with the exception of the bacillus of anthrax, yet it was not safe to allow the effluent to reach any water which might possibly be used for drinking purposes. Captain Rogers stated that the septic tank process was beginning to be introduced in various places in India.

Dr. H. M. FERNANDO (Colombo) stated that there were serious objections to the pail system. Owing to the frequent ablutions of the natives there was a great danger of surface pollution and thereby contamination of the wells. Again, many sects of natives would not eat the cereals or vegetables grown on soil manured by human excreta and would not even give the products of such land to their domestic animals.

Dr. W. B. CLARKE (Barbados) mentioned that in Barbados the septic tank system had been in use for a considerable time. The soil was a porous limestone and the excreta were received in cavities dug out in this soil and covered over. He had lately had occasion to open one of these tanks into which the house drainage had been received for a long time and found it quite empty and free from smell. He mentioned that he knew of a number of persons being infected by typhoid fever from the opening of a trench in which typhoid fever stools had been thrown 12 months previously. He asked for information concerning the effects of sunlight on septic tanks.

Fleet Surgeon P. W. BASSETT-SMITH, R.N., drew attention to the possibility of the ova of intestinal parasites gaining access to the human body when the excreta were utilised for manuring the soil in which vegetables were grown.

Sir PATRICK MANSON, K.C.M.G., considered that the system of disposal of excreta practised in China was admirable from a sanitary point of view.

Dr. F. M. SANDWITH (London and Cairo) said that although he condemned the cesspool system on principle his objections to it had been considerably modified from his experiences in Egypt. He had endeavoured to induce the Egyptian Government to introduce a water-drainage system, although he was bound to confess that he had never known any epidemic to arise from cesspools. Provided that the cesspool was water-tight and the contents were removed by pumping and conveyed by a tube to a cart there could be few objections to the system.

Mr. J. CANTLIE (London) regretted that in the discussion the terms employed had not been more carefully defined. Some of those who took part in the discussion seemed to be confusing cesspits with cesspools and pervious cesspools with septic tanks. It was useless arguing on such a basis. Moreover, the term "tank" might refer to a closed or open structure, in one of which anaerobic bacteria became virulent

and in the other aerobic germs thrive. Even when a tank was exposed to the air the bacterial (aerobic) changes were confined to the surface layers unless the contents of the tank were frequently stirred. In this the Chinaman showed his wisdom, for he from time to time stirred the contents of the barrel in which he stored the excreta, thereby insuring a more complete bacterial change than in the underground septic tank in use in this country.

Dr. L. W. SAMBON (London) drew attention to the fact that the cesspool system and the employment of the contents for manuring purposes had been in use in many parts of Italy from the time of the Romans. The danger of using the excreta for gardening purposes was that the vegetables became infected to such an extent that it was impossible to cleanse them by even most thorough washing. It was therefore dangerous to eat vegetables raw from soils that had been thus manured.

Captain A. F. W. KING, I.M.S., remarked that private latrines in India were so numerous that the septic tank system could not be thoroughly carried out.

Major J. PENNY, I.M.S., stated that the pail system had been introduced into Burmah with success. Provided that the buckets, &c., were carefully cleaned and inspected the pail system suited the habits and customs of the natives of Burmah admirably.

Dr. C. CHRISTY (Liverpool) said that the destruction of sewage by incineration was no doubt the safest from a hygienic point of view. When sewage was used for manuring purposes there was great danger of the spread of disease by insects. In Uganda the natives used a cesspit into which they all defecated and when it was full they covered it over and dug another cesspit. In a country in which there were no wells this system answered admirably.

Mr. K. W. GOADBY (London) stated that a septic tank, properly speaking, was an anaerobic tank from which leakage was impossible and that the cesspool as generally built was especially arranged for subsoil pollution. Most pathogenic bacteria were preserved at their greatest virulence under anaerobic precautions, hence the passage of the effluent over the aerobic filters might tend to destroy those pathogenic bacteria which might have passed through the septic tank.

The PRESIDENT agreed with Dr. Sambon that vegetables treated with human excreta should not be eaten raw. Ravenal in Philadelphia found the bacillus of anthrax distributed by spores after passing through the septic tank. As a means of combating the outbreak of typhoid fever in the United States Army during the late war Reed had insisted upon doing away with open cesspools in the camp and receiving the excreta in closed tanks, with the result that typhoid fever disappeared from amongst the troops.

Dr. SIMPSON, in replying to the arguments advanced, stated that he did not advocate cesspools for large towns. The danger of eating plants grown on soil manured by excreta could be easily guarded against by selecting the crops to be grown. From the danger of the spread of infection by flies he was not in favour of the open tank bacterial treatment of sewage but of the closed septic tank.

Fleet Surgeon BASSETT-SMITH, R.N., read a paper entitled *Sprue, Primary and Secondary, with Special Reference to the Blood Changes found, with Illustrated Cases.*

Amongst the sailors of the British fleet on the China station sprue occurred occasionally. The climate seemed to be an etiological factor in sprue and the higher the temperature of the locality the more serious was the type of the disease. According to the surgeons of the United States army in the Philippines sprue was a post-dysenteric disease, an assertion which he did not agree with. He regarded sprue as a disease of bacterial origin associated with chronic inflammatory changes in the intestine, causing a diminished supply of those nitrogenous products which were required in the formation of the red corpuscles. The anæmia in sprue was so pronounced at times as to resemble pernicious anæmia except that the hæmoglobin value of the cells was also reduced and megaloblasts were not present. The characteristic features of the disease were irregular and chronic diarrhoea, flatulence, fermenting offensive stools, progressive emaciation, extreme secondary anæmia, and changes in the buccal mucous membrane with or without aphthæ. The post-mortem appearances were a thinning of the gut with destruction of the mucous membrane and its absorbent

glands. The primary form of the disease was that in which the symptoms were insidious and commenced as ordinary diarrhoea. The secondary form followed after a dysenteric attack, the dysenteric processes having subsided. In a case of primary sprue he had found from a blood count that the blood showed excessive changes; the red corpuscles numbered only 1,000,000 and the white corpuscles 2960 per cubic millimetre. After treatment with iron and arsenic in very full doses and fresh bone marrow with ox gall pills the blood count showed marked improvement. The other case recorded in the paper was one of secondary sprue which had ended fatally. The post-mortem examination showed that the lungs were congested and cedematous, that there was fatty degeneration of the heart, that the liver was large and pale and weighed 77 ounces, that the pancreas was large and hard, that the stomach was greatly distended, that the intestinal wall was almost diaphanous, and that there was no ulceration in any part of the intestine. There were shown charts of the temperatures, a table of the blood counts, a diagram of the blood film, microscopic specimens, and a spirit specimen of the gut demonstrating the excessive thinning.

Sir PATRICK MANSON said that of the three dietaries, milk, meat, and strawberries, recommended in sprue it was not desirable to follow rigidly any single line of treatment, but to alter from one to the other as occasion and the peculiarities of the patient required. He had obtained marked beneficial results from the administration of a preparation of arseniate of iron (Squire) administered hypodermically.

Dr. CLARKE stated that sprue was common amongst the natives in Barbados and remarked that pigmentation of the skin and lunacy were characteristic features towards the termination of the illness.

Dr. G. C. LOW (London) did not believe that the disease termed sprue in Barbados and described by Dr. Clarke was the same disease as Oriental sprue. He had seen the cases in Barbados and thought they were more of the nature of pellagra or some closely allied disease.

Mr. CANTLIE believed that the early indications of sprue consisted in a catarrh of the buccal, pharyngeal, and gastric mucous membranes. In the Far East attacks of tender tongue and painful ulcers on the gums were common ailments and in time those who suffered from these conditions developed sprue if they remained in the East. He had previously ascribed the disease to the use of acrid oils used in cooking by the Malays and Chinese. At a meeting of the Tropical Section he had advocated a purely meat diet for sprue and he for some 12 years employed that line of treatment exclusively with marked benefit.

Mr. GOADBY stated that he had been engaged for some time at the bacteriology of the mouth in sprue but as yet had come to no definite conclusions on the subject.

Dr. CHRISTY contributed a paper on

The Entry of the Spore into the Red Corpuscles.

He stated that at that stage of the life cycle of the malarial parasite when the sporocyte broke down and it became a free agent in the plasma and then entered and developed in another blood corpuscle there appeared to be a gap in their knowledge. He showed by a series of drawings the process of entry of the spore. He remarked that a spore could not long remain free, but instead the minute particles of the protoplasm, now active amoebulae, adhered to the rim of the very first corpuscle which they came in contact with. He showed diagrams and specimens of these adhesions and in one demonstrated three amoebulae attached to the rim of one corpuscle.

ORAL INSTRUCTION OF THE DEAF.—The annual meeting of the Association for the Oral Instruction of the Deaf and Dumb was held on July 29th at 11, Fitzroy-square, London, W. The Rev. C. H. Parez moved the adoption of the report for 1902, which was seconded by Mr. B. St. John Ackers. The director, Mr. van Praagh, then made a few remarks about the year's work and referred to the spread of the pure oral system, expressing the hope that much more would be done by the Government in the future both for the training of teachers of the deaf and for the education of deaf children. The staff of the practising school gave an illustration of the system—teaching by speech and lip-reading—showing the work in the elementary and advanced stages. Miss Amy Paget distributed the certificates and prizes to the successful students and pupils.