

of the greatest importance. Milk producers would have confidence in a good product, and could expect to enjoy a better market and better prices. The department was greatly interested in the subject, and he was informed that the Minister for Agriculture also proposed to introduce his own legislation. As to pasteurization, there were some methods which were absolutely useless for protecting the public. The process of pasteurization would have to be subjected to regulations, and not every form of it would enable a licence to be obtained. It was true that infected milk could come from a tuberculin-tested herd, but under the Bill the "special designation" would be granted not because the milk came from a T.T. herd, but because it reached a high standard of purity.

Reports of Societies

SOME ASPECTS OF ANAEMIA

Lecture by Professor Minot of Harvard

On his way to receive the Nobel Prize at Stockholm Dr. G. R. Minot, professor of medicine at Harvard, visited London and was prevailed upon to address a special meeting of Fellows of the Royal Society of Medicine on November 29th. Dr. Robert Hutchison, President of the Society, was in the chair.

Professor MINOT addressed himself to the question of certain aspects of anaemia. There had been a tendency of recent years, he said, to decide at once on liver or iron treatment and to forget that a proper therapy depended upon an understanding of the mechanisms producing the anaemia. It would be extremely unfortunate in a given case if, both liver and iron treatment having been prescribed, the patient got symptomatically well while yet it was not known whether he should continue on liver for the rest of his life or on iron indefinitely. The economic aspect of such a situation was not unimportant. Therefore, it seemed useful to review some of the problems of the aetiology of anaemia and some aspects of diagnosis.

THE AETIOLOGY OF ANAEMIA

Anaemia in many instances could be attributed to defective nutrition, which might arise in other ways than diet deficiency. Multiple factors might be responsible for the anaemia in any one case. Man in this respect was not like experimental animals. Nutrition might be inhibited by infection or by damage to vital organs of the body, such as the liver or cardiovascular apparatus. The degree of deficiency varied, and each case was an individual problem. The principle of treatment must be to replace the deficient factor on a quantitative basis. That might not always be realized when large amounts of iron were being given at relatively little cost. The patient himself was not to be forgotten for the sake of treating his anaemia *per se*. Pernicious anaemia was a disease affecting more than the blood-forming tissues; it involved the central nervous and the gastro-intestinal systems. In diagnosis the use of the stomach tube or the tuning-fork for bone vibration might be as valuable as a complete blood examination. In dealing with the aetiology of pernicious and related macrocytic anaemias, Professor Minot pointed out that the lack of gastric reaction leading to formation of substances necessary for maturation of red blood cells might be due to deficiency of the gastric (or intrinsic) factor, the food (or extrinsic) factor, or to a deficiency resulting from inability to absorb or utilize substances transformed in the body.

He divided anaemias of specific malnutrition into "liver extract" or macrocytic anaemia, "iron" or hypochromic anaemia, vitamin C anaemia, and copper anaemia, as seen in experiments on rats. In the case of "liver extract" anaemia he catalogued four factors: food, as in sprue; gastric, as in pernicious anaemia; absorption, as in coeliac disease; and internal metabolism, as in cirrhosis. In connexion with "iron" anaemia he

also indicated four factors: intake, absorption (anacidity), utilization, and blood loss, as in pregnancy. He showed a diagrammatic slide in which optimal and usual nutriments were indicated by higher and lower levels, with, below these, a zone of partial deficiency, and, lowest of all, a zone of complete deficiency. In all these anaemias there were two main considerations—namely, what was taken by the mouth and what the gastro-intestinal tract was doing. Given perfect dietary and perfect gastro-intestinal function, there would be perfect nutrition. In a very general way it might be said that these two factors interacted; one might be perfect and the other show some deficiency, but if there were deficiency in both the lowermost zone was reached. But there might also be some difficulty in utilization by reason of certain inhibitory factors such as infection, or some organic abnormality, or the lack of some accessory factor concerned in the mechanism. Again, the absorption stage might be successfully completed when there might occur chronic blood loss, resulting again in a deficiency condition.

RELATIVE FREQUENCY OF PREDOMINANT SYMPTOMS

Professor Minot proceeded to an analysis of 100 cases with a view to discovering the relative frequency of predominant symptoms at the onset of pernicious anaemia; of these cases half were seen in private practice and half in hospital. In thirty-one the predominant symptoms were gastro-intestinal; in twenty-six, nervous; in thirty-three, generalized; and in ten, cardiac. He had also ascertained the time which had elapsed from the onset of noticeable symptoms to the diagnosis of pernicious anaemia. For the four classes just mentioned the average time, in years, was respectively 2.19, 1.28, 0.72, and 0.95, making a total average for the hundred cases of 1.36. In thirty-five cases there had been a long history of "indigestion"; the latter had been noticed occasionally for over twenty years in sixteen cases; in eight others there had been recurrent "bilious" attacks over a period of three to seven years; in seven diarrhoea attacks had been frequent for from seven to fifteen years; and in four indigestion had been more or less constant for from seven to twelve years. In thirty of these cases there was an undoubted gall-bladder symptomatology. If, after treatment with liver or a proper substitute, the gastro-intestinal symptoms, however pronounced, did not clear up, there was a distinct suggestion that gall-stones were also present. A few years ago it was customary to see patients who were jaundiced or distinctly yellow. To-day the amount and frequency of distinct sallowness was not nearly so appreciable. This was explained by the fact that nowadays a patient did not remain long enough to have had a series of relapses and remissions before receiving treatment. In a series of cases analysed in 1918 the spleen was palpable in about 35 per cent., whereas in the present series it was palpable in only about 5 or 7 per cent. This again was explained by the greater promptitude of treatment.

CONCOMITANT DISEASES

Concomitant diseases sometimes upset the diagnosis; Wilkinson had published an excellent paper on that subject.¹ It was interesting to note that an appreciable number of patients had carcinoma of the stomach develop some years after they had had pernicious anaemia. In the lecturer's clinic they had tried to discover whether there was any greater incidence of this condition among the people with pernicious anaemia than among the normal population for a given age. The statistical data had not been completely worked out, but the evidence tended towards the probability that there had not been a greater incidence among the people with pernicious anaemia than among a normal group, yet reasons why cancer of the stomach might develop could readily be imagined. A considerable number of papers had appeared during recent years showing the coincidence of diabetes and pernicious anaemia, and the diabetes had almost invariably, with a few exceptions, occurred first, and the pernicious anaemia

¹ *Quart. Journ. Med.*, 1933, ii, 281.

some years later. That opened up some interesting speculations, but he knew of no clear explanation at present. Of course, it must not be forgotten that pernicious anaemia, like other diseases, might have not so much complications as concomitant conditions. In his series of 100 cases, for example, some thirty patients had certain evidence of chronic arthritis of one type or another, and sometimes the symptoms of arthritis were so apparent that the state of the blood had been considered as secondary to the arthritis, so that there had been failure to recognize the case as one of pernicious anaemia. Pernicious anaemia also brought about an aggravation of conditions which had arisen earlier and independently. For example, women who had been subject all their lives to easy bruising, with defects in the blood-coagulation factors or platelets, might show concurrently with pernicious anaemia a great increase in that bruising sufficient for a diagnosis of purpura to be made. The differential diagnosis of other blood disorders he would not discuss. If there was failure of treatment with liver it meant that there was incorrect diagnosis, or that the treatment had been inadequate in quantity, or that the patient suffered from a condition such as an infection severe enough in itself to lead to a fatal issue. There were very rare cases of macrocytic anaemia with no distinctive features and a normal gastric analysis, which showed no response to liver or other therapy.

As with all deficiency diseases, it should always be borne in mind that the disease might be precipitated by infection. In some 11 per cent. of his cases the symptoms appeared concurrently with an outspoken infection; in 15 per cent. they appeared in association with some change of dietary; it was probable that in these cases the intrinsic and extrinsic factors worked together according to the law of mass action. In treatment it was necessary not only to get the patient better, but to get him as well as possible. The reservoirs of the body must be filled up. The treatment must be optimum. There could be no standardization of treatment, no prescription of arbitrary amounts. Enough material must be given to meet all the demands of the individual patient. Probably it took more to prevent the progress of neural lesions than to permit the blood elements to be maintained. A study of what could be done for the neural lesions should not be based on the degree of amelioration, but on the evidence of arrested progress. Of course, if the blood could be improved it meant a return of strength, an exercise of muscles, and improvement of the circulation, and reacted on the general progress in that way. Unfavourable reports on liver therapy were often due to a failure to appreciate the fact that there was no standard dose, and that it was the individual patient who must be treated.

NEURAL LESIONS

In his own clinic during three years there had been twenty-six cases of pernicious anaemia with advanced subacute combined degeneration. An observation of these cases lasting over many months was made by a number of independent neurologists, and in no instance while the patients were under treatment with liver did a single objective neurological sign become more marked; there was objective arrest in many cases and subjective improvement in all. He showed a chart of these twenty-six cases, and indicated that in 17 per cent. signs which had been abnormal became normal, and in no instance was there evidence of progress in the lesion. It was considered, therefore, that the progress of a spinal cord lesion could be arrested with enough material. The sooner the treatment was begun the better. In these patients it was very important to pay attention to training exercises and to improvement in the circulation, if this was not normal. If these patients had to take to bed for some other cause their disorder would be more noticeable on resuming activity, and this should not be ascribed to a progressive lesion. Such patients also complained that their symptoms got worse with the onset of cold weather. This was simply that a person with a damaged spinal cord felt the cold more than others. If severe infection were present it would inhibit the effect of therapy on the

cord lesion quite as much as on the blood. Individualism throughout was the keynote.

In a word on liver preparations Professor Minot stressed the need for a knowledge of the material which was being used. Many extracts in all countries were labelled as "Derived from . . ."; the important information was not what they were derived from but what they were equivalent to. He emphasized the value of the parenteral use of extract. To administer the material intramuscularly had various advantages. It was probably more economical as the oral method, and absorption was assured. It was useful in cases of increased resistance to therapy because it enabled as large an amount to be given as desired, with the assurance that the patient was definitely obtaining the material. Administration must be regular and frequent; arbitrary methods led to unnecessary illness. Each case, however, was an individual problem; there was no one rule for all cases, and if it was more convenient to give by the mouth this might be done. More liver was required when the patient was over 50; when there was arteriosclerosis, cardiovascular or kidney disease, or disease of other vital organs; when there was infection; perhaps when there was chronic fatigue; during pregnancy; and in the presence of neural lesions.

IRON AND ITS UTILIZATION

The use of iron in hypochromic anaemia had been dealt with in a most scholarly way by L. J. Witts.¹ In passing it might be well to mention that there were other substances in liver besides the liver extract which were effective in anaemia, these including iron itself. In the use of iron the exact proportion was unimportant so long as enough was given for the individual case. There was probably almost no use for iron administered intramuscularly; it must be an exceedingly rare case in which that was strictly needed, and to give enough iron intramuscularly would create uncomfortable symptoms. A certain number of patients might have a double deficiency in the sense that they needed liver extract and also needed iron. The combination of liver and iron was worthy of study. An occasional case might do better with both than with either alone, but it was usually one or the other that was needed, and the combination was seldom of importance.

In his clinic the question had lately been raised whether the pigments of the body could in any way be used in the manufacture of haemoglobin. Some of the bile pigments had been studied from this point of view. Concentrated bile pigments were obtained, and a group of cases studied by means of the double reticulocyte reactions. If material was given to a certain amount and there was a reticulocyte reaction, and then more material was given, and there was a second reaction, it implied that the second lot of material was more potent than the first. With that in mind, the effect of bile pigments introduced at a certain point was studied. Professor Minot exhibited graphs which went to show that the addition of bile pigments accelerated the utilization of iron, and was probably not dependent on absorption phenomena. Chlorophyll also had been studied in many directions. Pure chlorophyll preparations had only been available for a short time. Chlorophyll accordingly was tried, and thirty observations had been made on fifteen cases of idiopathic hypochromic anaemia. When the chlorophyll preparation was added to the iron there was an increase in the haemoglobin and a definite reticulocyte rise. With iron and crude chlorophyll employed in disproportionate amounts the result was negative, but it became positive when iron and crude chlorophyll were used in the relation of 1 to 6 up to 1 to 12. Positive results were obtained with iron and crude chlorophyll and with iron and sodium chlorophyllide given orally or intramuscularly, as well as with other preparations. In other words, it might be said that chlorophyll as a pigment in the body did something which accelerated the utilization of iron. Professor Minot added that he did not regard this for a moment as being of any great practical importance, though it was of physiological interest, and there might occasionally be

¹ *Proc. Roy. Soc. Med.*, 1933, xxvi, 607.

cases in which it had a practical bearing. So far he had had two cases in which a preparation of bile pigment brought up the haemoglobin quite promptly, in two weeks, 14 or 15 per cent. It was then stopped and the haemoglobin fell back. A similar rise was noted when a chlorophyll preparation was used, and a fall when it was withheld. He thought this had a bearing on the way in which iron might be used in the body, but he did not want anyone to race off with the idea that chlorophyll must be given in all cases. At the same time, it might offer some further approach to an understanding of the mechanism whereby iron was utilized. The observations had left him wondering whether the value of spinach might not be in its goodly amount of chlorophyll as well as in its content of iron. Possibly some natural foodstuffs enabled a better use to be made of iron in the body, and of these accelerating factors probably chlorophyll was one.

He concluded with the remark that in spite of recent advances in the knowledge of anaemia there remained much that was still unknown. The continual study of patients at the bedside was essential, as well as a recognition that the science was unstable, that the art was uncertain, and that the sick individual must remain in the centre of the picture.

A vote of thanks to the lecturer and of congratulation to him on the Nobel award was accorded on the motion of Dr. MORLEY FLETCHER.

AETIOLOGY AND TREATMENT OF ASTHMA

At a meeting of the Section of Medicine of the Royal Society of Medicine on November 27th, with the vice-president, Dr. MORLEY FLETCHER, in the chair, Sir HUMPHRY ROLLESTON opened a discussion on "The Aetiology and Treatment of Asthma."

Sir Humphry Rolleston suggested the elimination of renal and cardiac asthma, but said that even with this limitation the subject was enormous. Asthma was a symptom, and only one, of a large and as yet incomplete group of diseases known as allergic—the toxic idiopathies. The name "allergy" had been introduced by von Pirquet to describe all forms of altered reaction of the organism, but it was now used only for hypersensitiveness, the word "anergy" or "negative idiosyncrasy" being used for diminished sensitiveness. The cause was the underlying constitutional state, usually inherited or latent, transmitted on Mendelian lines. It was tempting to invoke an endocrine origin, particularly in the adrenal or thyroid, but the suggestion was met with clinical inconsistencies, as allergic symptoms were rarely seen in Addison's or Graves's disease. Strong evidence had been adduced to show that failure of adrenal secretion was the cause. The integrity of the internal environment depended on the autonomic nervous system, and vagotonia had been described as the primary cause. Should eosinophilia, he asked, be regarded as a defence mechanism or a concomitant reaction? If adrenaline injection drove the eosinophils from the peripheral circulation they must be at best an inconstant protection. Secondly, there was the localizing cause which determined the particular manifestation. In addition to trauma an inherent want of vitality might exert an influence. The many methods of treatment included physical exercises, wide-field x-ray exposures, specific and non-specific desensitization, and urinary protease.

Dr. JOHN FREEMAN said that the modern minute doses of toxin-antitoxin offered a danger of sensitizing people, so that the next protective inoculation might cause necrosis at the site of injection. The definition of allergy given by Sir Humphry Rolleston must include anaphylaxis and immunity phenomena; von Pirquet had included cancer and old age. All the symptoms of an infectious disease must be in a way allergic. Whenever the irritant poison came in contact with the tissues there were symptoms likely to arise; this accounted for localization. There was also a tendency for one particular variety to run in the family. Damage was undoubtedly a precipitating cause of great importance, and irritation was likely to limit the manifestation to a special spot. Psychological

factors undoubtedly played a part; they were present in all cases. Psychologists described the toxic idiopathies as anxiety neuroses, the mind "choosing" the type of reaction that best symbolized the patient's trouble. Amelioration, and at times real cure, might be produced by desensitization.

Dr. J. LIVINGSTONE said that specific sensitization could be cured or helped by inoculation, but that some patients were sensitive to a very large group of causes, and some 40 per cent. of patients would get better whatever the treatment, if it were given with sufficient authority. Expiratory breathing exercises had proved successful in many patients. The principles were to expire and get rid of the functional emphysema, to get the diaphragm working habitually, and to mobilize the chest muscles. Extraordinary control and mobility could be attained. Of seventy-seven cases 66 per cent. were very much improved, and only 18 per cent. showed no benefit. A good deal of time and patience were required to keep the patients practising regularly and to arouse enthusiasm. Also, much depended on giving them the feeling they were going to improve. Patients learned to prevent attacks by doing the exercises. The treatment was simple, and the results compared well with other methods.

Dr. GEORGE BRAY said that an ordinary case of asthma was mostly sensitive to inhalants, food playing but a small part. The groups were: animal hairs, feathers, dust, and orris root. The obvious treatment was to inject with these singly or together. An ordinary case could be desensitized by relatively large intramuscular doses of a solution of these four, as concentrated as possible and combined with adrenaline. Patients who ascribed their attacks to food usually had gastro-intestinal disturbances, and treatment of these was needed—not desensitization to food. Attacks might become conditioned reflexes in allergic persons. The nose became very unhealthy after repeated attacks, but the changes disappeared after desensitization, and operative interference was seldom necessary. Bacteria did not play an aetiological part in the attacks, but lowered resistance and so increased sensitiveness. Specific desensitization was therefore the most practical method of treatment.

Mr. C. GILL-CAREY reported on 181 nasal cases seen in the last ten years. Allergic rhinitis accounted for a large proportion, and could be recognized by the typical colour changes in the mucosa. Bacterial infection had been superadded in about 10 per cent. Treatment was difficult. Temporary improvement followed practically any surgical operation. Interference should, however, be confined to removal of polypi in purely allergic cases. Non-allergic abnormalities accounted for about 10 per cent., and satisfactory results were obtained by treating sinusitis. The temptation to attack hypertrophic masses of allergic tissue must be withstood, but rhinological treatment gave satisfactory—at times brilliant—results in asthma.

Professor ERNEST M. FRAENKEL showed his film on allergy and protective apparatus. There were, he said, two independent variables to be considered: the constitution, and specific allergens. The film showed skin tests, portable filtering apparatus, an allergen-free room, a zipped sleeping-bag, and a high-pressure tube for several out-patients to use at once. A patient sensitive to dog hairs was shown breathing contentedly through the filter, although dog hairs were shaken into the air in front of her; without her knowledge the filter was removed from the apparatus, and at once she suffered a typical attack. The apparatus had therefore diagnostic as well as therapeutic value. In some cases the psychological effect of confinement in the mask or room was bad at first, and had to be overcome. Use of the apparatus for part of the day sometimes protected the patient for the whole day. Asthma in Germany and in England was very similar.

Sir JAMES DUNDAS-GRANT emphasized the importance of examining and treating the nose in asthma. In some of his cases specific sensitiveness had disappeared after nasal treatment. Hypersensitiveness was an explosive, but it required a detonator, and this part might be played by the nose. Dr. E. PARKES WEBER mentioned adrenaline treatment, which, he said, diminished or prevented the reaction in some cases of asthma. Acute generalized

dermatitis of unspecified allergic origin gradually disappeared in time, but if treated by rest in bed and semi-starvation it cleared away much more rapidly. The reason might be removal of an allergen from the food, or that relative starvation lowered the allergic reaction just as adrenaline did: probably both factors played a part. Bleeding might be a correlated factor; it had afforded relief, in olden days, in "sthenic attacks of pneumonia"—probably allergic phenomena. Dr. JAMES ADAM spoke of the nutritional factor, ending in toxicosis. Asthma in canaries, dogs, and other pets could be cured by regulated feeding, plenty of open-air exercise, and blue pill. Nasal, nervous, endocrine, and psychic factors did not enter in animals. "Only" children were in the same position as pets: they were coddled, overfed, and their sympathetic systems were not stimulated. The struggle of the body to maintain the alkalinity of the blood was the chief problem. A dose of urea sent up the eosinophil count, and might precipitate an attack. A cold douche after a warm bath kept adrenaline flowing and reduced eosinophilia. Golf was most useful in treatment. Mr. C. FRANCIS thought that removal of polypi benefited asthma only if the blood pressure was normal and the patient was not aspirin-sensitive. Light cauterization of the septum reduced high blood pressure and improved asthma. Anything that improved the circulation improved asthma.

DIAGNOSIS OF INTRACRANIAL TUMOURS

At a meeting of the Medical Society of London on November 26th, with Lord HORDER in the chair, a discussion took place on the value of accessory methods in the diagnosis of intracranial tumours and allied conditions.

VENTRICULOGRAPHY AS AN AID TO LOCALIZATION

Mr. HUGH CAIRNS said that it was just fifty years since Godlee's operation for the removal of tumour of the brain. The greatest significance of that event of 1884 was that Hughes Bennett, Ferrier, and Hughlings Jackson felt sufficient confidence in their growing knowledge of cerebral function to predict the presence and precise situation of the tumour and advise its removal. Looking back, it seemed that brain surgery was set in motion by the advance in diagnosis. Accessory methods had helped greatly to increase its scope. They could not be employed with discrimination in any one case, however, until careful clinical studies had been made; the value of these accessory methods was enhanced or belittled according as clinical studies were positive or negative. A preliminary question was whether lumbar puncture was dangerous in intracranial tumour. It seemed to him that lumbar puncture was often rather loosely used, also that too much fluid was taken. The dangers were minimized if the fluid was only in small quantity. After showing some cases which illustrated the value of x rays alone, he came to the methods of air injection, introduced in 1918. The method was at first called ventriculography, but when it was found that a lot of air went into the subarachnoid space as well it became "encephalography," and as such was adopted widely in Germany, where, in spite of initial claims that it was without danger, it had been shown that the injection of such a large quantity of air resulted in severe headache, lasting for some days. It had been found recently, however, that by putting in 10 or 15 c.cm. of air by lumbar puncture, with the patient sitting and the head slightly flexed, a good outline of the ventricles in the antero-posterior view was obtained, and without too great an ordeal for the patient. It was this method of ventriculography which he had used, and by means of lantern slides he discussed the significance of the appearances in the various deformities of the ventricular system produced by tumours, and it was remarkable what a large deformity a small tumour would produce. He showed how the position could be inferred from the difference in level of the two ventricles, also how guidance could be obtained as to third ventricle tumours, the localizing diagnosis of which, from the clinical point of view, was extremely difficult.

The limitations of ventriculography were that it would not show gliomatosis or sarcomatosis or any of the diffuse

tumours, that non-surgical lesions would sometimes produce deformity of the ventricles, and that the method would not give the pathological diagnosis. Its advantages were that it saved operative exploration in a number of cases suspected of tumour, it was a better form of exploration than operation, because it enabled more to be seen of what was going on inside the cranial cavity than an opening in the skull, and it was now without use in the post-operative period. He had never experienced any trouble with it in a patient who had normal ventricles and no intracranial tumour though one had been suspected, but in cases in which there were actually tumours the method had its dangers, the most important of which appertained to general reactions in the patient. Sometimes after air injection there ensued progressive stupor. To avoid danger the first thing was to let out the air and operate immediately. It was customary to make the x -ray examination early in the morning and proceed with the operation as soon as the plates had been read. To avoid the dangers attending ventriculography the method of ventricular estimation had been introduced. The estimation was done by aspirating fluid instead of injecting air. If one lateral ventricle was small or collapsed and the other reasonably large, the tumour must be on the side of the collapsed ventricle; if both lateral ventricles were dilated, the tumour must be in the third or fourth ventricle. Ventricular estimation was done as a routine in every case of cerebellar exploration and saved many mistakes. Mr. Cairns had particulars of 129 cases, in forty-two of which air injection had been done, and in twenty-seven ventricular estimation. Of the 129 cases the tumour was wholly or partly removed at operation in ninety-four; in eleven other cases the lesion was identified, but did not give histological material in four cases there were mistakes in diagnosis. In 105 of the cases the tumour could be localized correctly by clinical methods alone; in twenty of these the clinical methods did not give a certain localizing diagnosis, and in four the clinical examination gave a wrong localizing diagnosis. X -ray examinations provided crucial diagnostic evidence in three cases and false localizing signs in three. Ventricular estimation was the main factor in five cases. The future lay in much more careful clinical examination and further experience of tumours.

EXAMINATION OF CEREBRO-SPINAL FLUID

Dr. J. G. GREENFIELD said that in going through his records he had been struck with the great variations from the typical cerebro-spinal fluid syndrome which were seen in cerebral tumours. The syndrome typical of cerebral tumour had raised pressure and increase of protein, with no increase of cells. Once the pressure passed 200 mm. it might rise rapidly to pressures dangerous to life. Pressures of 200 mm. were often found before there was any evidence of headache or vomiting. The rate of reduction of pressure was probably much more important than the situation from which the fluid was withdrawn. Normal pressures might be found with cerebral tumours and even with cerebral abscess; they were not uncommon with subdural haematoma. With regard to the danger of lumbar puncture, probably tumours in the middle line and low down in the posterior cranial fossa were much more liable to cause dangerous symptoms after lumbar puncture than those above the tentorium. The exception to the rule that cerebral tumour produced no increase of cells were few and well defined. One of the exceptions was gliomas when these occurred in the walls of the lateral ventricles. Another was cancers of the posterior fossa. There were forms in cerebral tumours in which excess of protein was the rule, and others in which it was the exception. In eighth nerve tumours a considerable excess was always found. Cancers of the posterior fossa usually raised the protein above 100 mg., but slow-growing gliomas and gliomatous cysts apparently did not. None was any great excess found in angiomatous cysts of the cerebellum. With tumours above the tentorium yellow fluids with only a slight excess of protein were indicative of haemorrhage only. It was uncommon to find excess of protein (over 100 mg.) in cases of meningeal endotheliomas or meningiomas, but his records included a few

cases of endotheliomas with proteins of between 100 and 200 mg. The more malignant gliomas were more apt to cause oedema of the surrounding brain tissue, usually reflected in a rise of protein in the fluid. In some cases it might be possible to distinguish between cerebral tumour, cerebral abscess, and subdural haematoma by the cerebro-spinal fluid, but one was never very safe.

Dr. M. H. JUPE said that results and conclusions could only be reached by a combination of methods. At times the radiograph would lead to the diagnosis of a case when other methods failed, but that was seldom. He showed examples of routine radiography, pointing out the signs indicating general increase of intracranial pressure. It was in meningiomas that the surgeon was most likely to turn to the radiologist for help. Meningiomas were extremely complex; they calcified, ossified, caused hyperostosis, and destruction.

BILATERAL VENTRICULAR EXAMINATION

Dr. OLJENICK of Amsterdam, who has worked out a special modification of ventricular estimation, said that the mortality figures for ventriculography were not very high, though he knew surgical departments where they were up to 8 per cent. He did not regard ventriculography as purely diagnostic, since by using it a long surgical intervention might be avoided, therefore perhaps some small mortality was not without excuse. Nevertheless, to reduce even this small mortality was worth while. In his clinic a method of bilateral ventricular estimation or examination had been adopted, puncturing the ventricles, examining the fluid from the two aspects (chemical and microscopical), and measuring the pressure. If symmetrical conditions were found in the right and left laterals it must mean that the obstruction, if any, was in the middle part of the ventricular system, in either the third or the fourth ventricle. He strongly agreed with the late Mr. Donald Armour that the pressure should always be measured on a manometer; it was not safe to count drops. Bilateral puncture and examination made it possible for the fluid to be taken out first on one side and then on the other. In a case of cystic glioma he had found a reciprocating action between the pressures, as though the fluids were in communicating vessels, which was not the case, and he came to the conclusion that it was due to the fact that the glioma was adjoining the ventricle on one side, and so the fluid might go one way or the other, according to the change in pressure of the ventricular system. Another advantage in having a double puncture opening was that in cases where it was not possible to reduce the intracranial pressure before opening the dura mater, the complementary opening allowed the pressure to be reduced without introducing intravenous salines. In 1933 he had carried out sixty-one bilateral ventricular examinations. When the results did not coincide with the clinical localization the examination was repeated—which was easy to carry out, as the openings were already present—and when again the results did not coincide, ventriculography was done; this happened in four of the cases. So far in 1934 he had done 110 ventricular examinations, and the number of ventriculographies had increased to twenty-seven. The danger of ventriculography was mostly in temporal lobe tumours, probably because in such tumours there was no falx cerebri to act as a buffer, and if there was a shift with any such tumour it reacted directly on the neighbouring tissue and the brain stem. If a ventriculography was done he followed it immediately by operation, but it was perhaps not correct to say that this reduced the mortality rate, because in such cases it was difficult to say whether the patient died from the ventriculography or from the operation, or both.

Dr. C. P. SYMONDS said that neurologists owed a great deal to the surgeon for the advance which had taken place in knowledge of the localization of cerebral tumours. The work of Mr. Cairns and his colleagues and of Dr. Oljenick in Holland had opened up a very real advance. Mr. JULIAN TAYLOR drew attention to curious annular shadows sometimes seen in the x-ray picture right in the substance of the hemisphere. One such case proved to be an aneurysm. He was unable to say why the aneurysm

should show such a clear shadow, but that it did so there was no doubt.

Mr. HUGH CAIRNS, in reply, expressed his agreement with Dr. Oljenick's remark that with a diagnostic method proper there should be no mortality, but in practice every diagnostic method had a mortality. If all the methods available were discriminatingly used, however, the ultimate outcome should be a lessened mortality for brain tumours, provided, of course, that surgeons did their work properly. People had asked whether it was worth while to diagnose intracranial tumours. The results in the past had not been such as to answer that question promptly in the affirmative. The brain had seemed rather a hopeless field for radical surgery. But he recalled a remark by Gowers in 1893 to the effect that it was not likely that the removal of a tumour from the mid-cerebellum could be survived. The people who were going about their ordinary activities to-day after having had tumours taken out of the cerebellum were numbered by hundreds, and he believed that in future the results of brain surgery would be still further improved, especially if, beforehand, the cases worth operating could be distinguished from those not worth operating. The future lay in the hands of the physician and in closer clinical examination of cases.

BILATERAL RENAL CALCULUS

At a meeting of the Cork Clinical Society, held on November 16th, Dr. D. F. HEGARTY presented clinical notes and treatment of a case of bilateral renal calculus in a married woman.

The history was that some years ago this patient was operated on for chronic appendicitis, and two months afterwards she had an attack of right renal colic, and passed a small stone two days later. She suffered no further disability for the next six years and had four full-term pregnancies. She became pregnant twelve months ago, and when seven months advanced she had another attack of right renal colic, and again passed a small stone. A month before confinement she had an attack of left renal colic, the pain remaining for four days. Radiography and pyelography after her confinement showed four calculi in her right kidney and a small one blocking her left ureter, and free excretion of the dye by the right kidney. Owing to the risk of calculus anuria and to the patient's condition, it was decided to remove only the calculi on the right side and not to interfere with the left side for the present. The patient made an excellent recovery.

Professor J. M. O'DONOVAN read a communication on "Pernicious Anaemia: Results in a Series of Cases." He subdivided his cases treated since the advent of liver therapy according to the response to treatment, and in each group suggested the reasons for rapid or slow response. One case of particular interest was that of a patient who developed pernicious anaemia after a partial gastrectomy. A prolonged discussion followed.

J. Rousset (*Presse Méd.*, September 29th, 1934, p. 1518) records a case of acute gastric dilatation with perforation after hysterectomy. Many causative factors of post-operative gastric dilatation have been suggested: infection from a perigastric peritonitis; mechanical obstructions; aerophagia and sialophagia; anaesthetics (especially chloroform); the state of the nervous system; and shock. Perforation is an exceptional complication; it has been noted during the course of certain nervous conditions, and ulcerous lesions may be a possible factor. Rousset believes that the dilatation is the most probable cause, and advances the following hypothesis. Subacute gastric dilatation supervenes after the operation, followed by haemorrhage, due to vaso-dilatation or distension of the mucosa; the mucosal lesion gives rise to an ulceration with subsequent necrosis and perforation. Simple gastric lavage, repeated as long as necessary, should be instituted on the first appearance of symptoms. Operative measures, owing to their poor results, are not advised.