

stillbirth must be registered as such if the foetus has advanced to the fifth month of gestation and shows no evidence of life after birth. This accounts for the comparatively high number of stillbirths included in the study—namely, 2,375, which gives a stillbirth rate of 28.1 per 1,000 live births.

Locality was not without significance, for premature births were more frequent in urban communities than in the rural parts of the State, but, on the other hand, the mortality was considerably higher in rural areas than in the cities. As might be expected, illegitimate births and plural births yielded much higher rates than those recorded for legitimate and single births, particularly in regard to prematurity. Thus the prematurity rate was 87.4 for illegitimate births and 259.1 for plural births. The stillbirth rate for premature infants was 249 as compared with 15.1 for full-term infants. The reduction in infant mortality during the past two decades is strikingly expressed in the brief statement that “in 1915 it was above 100, to-day it is below 50,” but the decrease in mortality is chiefly apparent in the age period 1 month to 1 year, where it is twice as great as in the age period of under 1 month. It is on this early period, and on the factors influencing the health of the mother during gestation, that attention should be concentrated in the future. It is the saving of life at its very beginning that is now the major problem.

### INSULIN THERAPY OF SCHIZOPHRENIA

In a recent number of the *Psychiatric Quarterly*, devoted almost exclusively to a number of American reports on the results of the insulin treatment of schizophrenia, Malzberg<sup>1</sup> has compared the immediate results in 1,039 cases of schizophrenia in New York hospitals with those obtained without such treatment in a similar number of control cases admitted in 1935 and 1936. The comparison is striking. Those treated with insulin were in many ways a less favourable selection, having among them a number of old cases. The controls were all first admissions, and consisted, therefore, principally of fresh cases. Nevertheless there were 12.9 per cent. of complete recoveries in the insulin group, as against 3.5 per cent. in the control group. If all degrees of improvement were counted the improvement rate in the treated cases was 65.4 per cent., compared with 22.1 per cent. in the controls. The fears which may have been felt that the benefits of insulin treatment may have to be paid for by an increased death rate do not appear to be justified. The death rate was actually lower in the insulin group (12.5 per 1,000) than in the control group (46.2 per 1,000). These figures are not strictly comparable, since the control group was observed for a longer period and the insulin group

represents a selected series; naturally persons physically ill would be excluded from the latter. Allowing for these factors Malzberg considers that the death rates in the two groups would prove about the same. Although insulin treatment must be compared to a major operation in the skill and attention demanded, yet its risks are not frightening, and since its benefits often include a noteworthy physical improvement, even in cases which do not improve much psychologically, it may obviate a number of deaths from debility, tuberculosis, and other causes. As to the type of the psychosis and the outcome of treatment, Malzberg finds, as was indeed to be expected, that the prognosis is worst in hebephrenic cases, both with and without insulin treatment. Even so, shock therapy gives as great a relative improvement on the results previously obtained in the hebephrenic as in the other groups. These findings are paralleled by those of Ruffin,<sup>2</sup> who in the treatment of 100 cases observed no improvement at all in hebephrenic cases. His findings show that the more florid the psychosis, especially if it is of the paranoid type, the better does it react to insulin, and that this criterion is of greater value in assessing the probable result of treatment than is the mere duration of the disease. Most writers on the insulin treatment of schizophrenia are convinced of its usefulness. Even those who are critical and cautious to the point of being pessimistic—for example, Horány-Hechst and Szatmári,<sup>3</sup> and Marzynski and Witek<sup>4</sup>—would not regard the treatment as without avail, and when the results obtained by these latter workers are examined such considerable success is shown that the authors in question might be suspected of excessive caution or of undue optimism about what is obtainable without insulin. Careful follow-up studies of treated and untreated cases are, however, necessary before a final assessment can be made of the results of the new therapy.

### SAFEGUARDING WATER SUPPLIES

Prevention of water-borne diseases formed the chief and almost the only concern of sanitation as it was understood a hundred years ago. Recent events have shown that even to-day it can be achieved only by careful and constant supervision of supplies of drinking water, and in this task effective collaboration is needed between the various officers responsible for the work and also between the water undertakers and the local authorities of areas served by them. A memorandum on the precautions necessary in the day-to-day administration of a water supply in order to maintain its wholesomeness has now been issued by the Ministry of Health. These precautions are no more than have long been recognized as good practice in water administration, and the Minister asks that the practice shall be brought up to this standard everywhere. An essential safeguard is care in the choice of workmen employed on any works where there is risk of conveying infection to the water. The clinical history of each workman,

<sup>2</sup> *Nervenarzt.*, 1938, 11, 518.

<sup>3</sup> *Mshr. Psychiat.*, 1938, 98, 101.

<sup>4</sup> *Z. ges. Neurol. Psychiat.*, 1937, 159, 704.

<sup>1</sup> *Psychiat. Quart.*, 1938, 12, 528.

particularly with regard to enteric infection, should be thoroughly investigated. Every new workman proposed to be employed on any part of the works where there is risk of his contaminating the water should be examined in order to ascertain whether or not he is likely to be a typhoid carrier. All buildings, machinery, apparatus, and yards used for waterworks purposes should be kept scrupulously clean and regularly inspected. Where the source of water is a reservoir impounding the head waters of a stream or an intake near the source of the stream the water undertaker should acquire the whole of the gathering ground and protect the reservoir or intake by adequate fencing, but if this is not practicable regular and frequent inspections of the whole gathering ground should be carried out. Where water is being supplied without treatment the undertakers should make frequent and regular analyses of the water. The analytical procedure will depend upon local conditions and should be determined in each case with the advice of experts. The safeguarding of water supply by special treatment such as chlorination requires the greatest care.

"There is often a tendency to think that, provided arrangements are made for chlorination, safety is secured whatever the condition of the raw water. It cannot be sufficiently stressed that a policy of reliance on a single line of defence between the consumer and a polluted source of water supply is fraught with danger. Not only should every effort be made, as has been suggested above, to keep the source as free as possible from pollution, but wherever practicable the method of treatment should be such as to provide at least two lines of defence, such as, for example, chlorination or other effective form of sterilization, after storage or filtration."

The memorandum also deals with the care of mains and hydrants and the safeguarding of the water supply during repair or cleaning. Where work is proceeding in a well or in a heading the water should, whenever possible, be cut out of supply and pumped into waste. Workmen should be provided with boots and overalls kept at the works, and the boots should always be cleansed with chlorinated water before the men enter the well. Proper sanitary accommodation should be provided for the men so as to obviate risk of pollution.

### RESEARCH IN HUMAN HEREDITY

In various research fields those engaged find it helpful to get in touch with other workers in the same subject. In genetics the army of workers on drosophila, mice, and maize have for some time now been helped by setting up an information service. The Council of the Bureau of Human Heredity is following this example. Such information is necessarily intended only for co-workers, and the plan of the service is as follows: Research workers are invited to send an intimation of the subject or subjects on which they are engaged to the office (not exceeding 100 words). This should be accompanied by a subscription of 5s. The material so collected is issued as a printed bulletin in three languages to subscribers only. Addresses of contributors are given with the date of their communication. This last point safeguards priority. The office at 115, Gower

Street, London, W.C.1, is about to compile Bulletin No. 2, and has already received information from many research institutes as well as individual workers abroad. The honorary officers of the Bureau invite co-operation from those interested in particular studies of human genetics in this country.

### SYPHILIS FROM TRANSFUSION

The report in our present issue (p. 264) by J. A. W. McCluskie of a case in which syphilis was undoubtedly transmitted by transfused blood must arouse some disquiet. In both this and two other cases reported within the past few years, to which he refers, the donor's chancre did not develop until some days after the transfusion took place. The presence of *T. pallida* in the circulating blood is an amply demonstrated and universally recognized feature of the secondary stage; but that this condition can exist before even the primary lesion is clinically manifest may be found surprising: it is nevertheless fully consonant with experimental observation, which has shown that the organism reaches neighbouring lymph glands from the point of inoculation with all the rapidity which might be expected from its capacity for rapid movement. The visible lesions of syphilis are in fact only the culmination of a process which has been going on silently for a considerable time. It is certainly desirable, as Dr. McCluskie suggests, that we should know whether the medication of blood will sterilize it for purposes of transfusion: there is a reasonable expectation that this could be achieved. Unfortunately this does not appear to solve the problem, because it would scarcely be feasible always to take this precaution against a risk which is exceedingly rare. To expect donors always to decline to act for a month after irregular intercourse has obvious drawbacks, nor would it be wise to try to bind them to absolute chastity. Only one of the donors concerned in these three cases was a habitual donor, and when such disasters occur a relative is much more likely to be the culprit, especially since there may on occasion be no time for any precautions to be taken other than by the asking of questions. Although it is conceivable that an action for damages might be brought on these grounds, it is so clearly impossible to detect this remote risk that the action might perhaps be successfully defended on that basis.

### REFUGEES AND RESEARCH

We print elsewhere (at p. 303) an appeal from Professor Major Greenwood on behalf of the Society for the Protection of Science and Learning (formerly Academic Assistance Council). In these times the claims upon our charity are so numerous that any fresh demand is irksome: if we cannot be the police force of the world neither can we be almoners of civilization. But the position of this society is unique. As Professor Greenwood points out, it is in no way concerned with the extremely difficult problem of foreign medical practitioners; it assists only pure scholars and scientific

workers. Some of our older readers may remember the presidential address of the late Dr. G. B. Ferguson at the Annual Meeting of the Association in Cheltenham in 1901, one of the most eloquent orations in our series. It was a plea for the encouragement of research in medicine. A Faraday, a Koch, or a Pasteur, he said, would be a cheap purchase at a million. Much has happened in the last thirty-eight years: medical research is no longer a Cinderella. But it is true that recent political events have thrown upon the world men of ability far above the average, and that in supporting the Society for the Protection of Science and Learning we not only advance the general cause of science but facilitate the growth of British and Imperial schools of higher learning and scientific research.

### PAIN IN PEPTIC ULCER

To overcome the possible errors of applying the results of experimental observations on animals directly to clinical medicine there have been many attempts to cultivate the study of human physiology and pharmacodynamics. The difficulty has been to devise methods of registering the results. One of the most fruitful of these methods has been the observation of muscle tone and contraction of the hollow viscera under physiological conditions and following the use of drugs, by placing in the viscus partially distended balloons connected with a recording apparatus—the experimental method known as “viscerography.” Morat recorded the gastric contractions of a patient in this way, and Carlson made similar observations on the fasting stomach of infants. Cannon, by means of balloons in the oesophagus, showed the muscle tone of this tube in relation to hunger, while in this country Payne and Poulton recorded the muscle tone and contraction of the gullet in swallowing and observed that pain was produced by distension. Professor Danielopolu<sup>1</sup> of the Faculty of Medicine of Bucarest and his students have applied this method for the past twenty years in a large series of experiments on patients, thus exploring the gullet, the stomach, the duodenum, the rectum, and the bladder. Although the mechanics of their method might well be improved, since the lag and over-swing of levers attached to rubber tambours produce quite artificial curves, the general results are interesting and important; and with improved technique much useful knowledge and record of clinical conditions should be obtained. Three of Danielopolu's assistants have carried out by the same method a study of gastric pain.<sup>2</sup> A sound with balloon attached is introduced into the stomach, the balloon is partially distended, and the free end of the tube is connected with a tambour and lever so that the movements of the stomach compressing the balloon are recorded on a moving surface. Danielopolu had in 1923 shown in this way that the pain of a gastric crisis in tabes was related to hypermotility of the stomach muscle, and the majority of authors attribute the pain of peptic ulcer to hypercontractility and hypertonicity of the stomach. Others, however, have incriminated gastric hyperacidity. To

settle this question, and to find out why the pain is so often intermittent, coming in attacks and leaving the patient free sometimes for weeks or months, was the problem of Dimitriu, Tanasoca, and Popovici. Their observations were made on forty cases of gastric ulcer confirmed radiologically. They regard it as established that the seat of the pain is in the diseased mucous membrane; the absence of pain can therefore only be explained by absence of acute inflammation. Indeed, in eighteen cases of ulcer in the stage of intermission they were unable to produce pain either by intense distension of the stomach, by injections of eserine or pituitary extract intravenously or of histamine subcutaneously, all of which brought on strong peristaltic waves, or by the introduction into the stomach of dilute hydrochloric acid in concentrations of 0.5 to 4 per cent. They conclude that the pain of peptic ulcer depends on three factors: one predisposing, depending on the inflammatory lesion of the mucous membrane; and two determining the contractility of the stomach and the acidity of the gastric juice. The factor of inflammation is indispensable, and in its absence pain cannot be evoked. Of the other two factors contractility is the more important and may in itself produce pain, as it undoubtedly does in cases in which subacidity or even anacidity accompanies peptic ulcer.

### POLYCYTHAEMIA VERA

Three recent papers on polycythaemia vera present different aspects of this interesting, if uncommon, disease. Rosenthal and Bassen<sup>1</sup> have studied a group of seventy-five cases in order to draw a complete picture of the disease. In the early stage it may be asymptomatic and be discovered when the patient appears for a routine examination. A red cell count of 8 million may be compatible with a feeling of absolute well-being. Later the patient presents such symptoms as headache, dizziness, weakness, paraesthesia, a ruddy complexion, and redness of the hands and feet. In about 75 per cent. of the cases the spleen is enlarged, and the liver in about 50 per cent. The blood pressure is often normal, but generally it is moderately elevated and in some instances there is pronounced hypertension, the so-called Geisboeck form. Haemorrhage and thrombosis are frequent complications and may bring the illness to a premature conclusion. The duration of the polycythaemia phase may be long, possibly ten to twenty years, and long remissions may follow successful treatment. Not infrequently it is easier to reduce the haemoglobin than the red cells, so that the colour index falls and the cells appear small and pale, though their total number remains high. This may be regarded as the result of treatment, but there are other complications which appear to be inherent in the disease. Such are thrombocythaemia, with increased risk of thrombosis of vital vessels, and polynucleosis, which may pass into a state indistinguishable from leukaemia. These complications are associated with the proliferation of megakaryocytes and immature white cells in the marrow, where leucopoiesis in fact is always more striking than erythro-

<sup>1</sup> *Brux. méd.*, 1938, 18, 819.

<sup>2</sup> *Presse méd.*, 1938, 46, 610.

<sup>1</sup> *Arch. intern. Med.*, 1938, 62, 903.

poiesis. In one of Rosenthal and Bassen's cases, a woman who had polycythaemia for thirteen years, the proliferation in the terminal leukaemic phase was so exuberant as to produce large tumour-like masses, both medullary and extramedullary, which were found to be leukosarcomatous. Should the patient survive these phases the disease tends to spend itself and to end in anaemia with sclerosis of the bones. In all this there is a strong likeness to the erythroblastic and megakaryocytic leukaemias to which we have referred in a previous annotation (November 26, 1938, p. 1090). Sohval<sup>2</sup> discusses the hepatic complications, with particular reference to thrombosis of the hepatic and portal veins and hepatic cirrhosis. While moderate enlargement of the liver is frequent, marked enlargement suggests a complication such as phenylhydrazine jaundice, cirrhosis, etc. A sudden enlargement of the liver with rapid accumulation of ascites, resistance to mercurial diuretics, and terminal jaundice points to thrombosis of the hepatic veins. Haden<sup>3</sup> emphasizes once again the importance of distinguishing polycythaemia vera from symptomatic polycythaemias due to an interference with oxygenation of haemoglobin, in which abstraction or withdrawal of blood would be harmful. The total red cell mass, as determined by estimation of the blood volume, is constantly high in polycythaemia vera and not significantly changed in symptomatic polycythaemia, and treatment should therefore be based on this finding.

### PROTEIN CHEMISTRY

The nature and organization of protoplasm is the chief unsolved problem in biology, and hence it may fairly be argued that the physical chemistry of proteins is a problem of unique importance. The outstanding difficulties attending the study of proteins are well known; these substances are very easily denatured by chemical treatment, whilst chemical analysis provides little help because the properties of proteins depend on the pattern in which the constituent amino acids are arranged. These formidable difficulties have acted as a stimulus to physical chemists, and the problem has been attacked by a remarkable variety of methods. An account of the varied work on the subject is provided in a volume recently published.<sup>4</sup> The earlier methods used were study of osmotic pressure, electrophoresis, action of proteins on surface tension, etc. Progress in the study of monomolecular films gave a new method which has yielded results of great interest, while development of the ultracentrifuge and of the technique of preparing ultra-filters with varying sizes of pores have jointly provided a fairly reliable estimate of the molecular weights of proteins. Analysis by *x* rays has advanced knowledge in another way by indicating the probable nature of the arrangement of the constituent parts in certain proteins. These very varied and delicate techniques together have furnished definite indications regarding the probable form of protein

<sup>2</sup> *Arch. intern. Med.*, 1938, **62**, 903.

<sup>3</sup> *Amer. J. med. Sci.*, 1938, **196**, 493.

<sup>4</sup> *The Chemistry of the Amino Acids and Proteins*. Edited by Carl L. A. Schmidt, M.S., Ph.D. Baltimore: Charles C. Thomas. (7.50 dollars.)

molecules. Miss Wrinch, by means of a happy combination of mathematics and imagination, has actually provided models of the possible structure of proteins based on the cyclol theory. These speculations explain a large number of experimental facts and have proved fruitful in inspiring further experimental work. One reason why the subject of protein chemistry is of special interest to-day is that virus research has elaborated proteins in crystalline form which possess many properties hitherto looked upon as attributes peculiar to living matter. Hence, if we possessed an adequate knowledge of the physico-chemical nature of ordinary "dead" proteins we should be in a position to begin to explain some at least of the fundamental properties of the living cell.

### NUTRITION IN CHILDHOOD

Sir Frederick Gowland Hopkins, Dame Janet Campbell, Sir Daniel Hall, Lord Horder, Mr. Julian Huxley, Dr. Eric Pritchard, Sir Robert McCarrison, and Sir John Orr are among those who are asking for public support for the Children's Minimum Council. In a pamphlet describing the aims and work of the council they plead for a national drive for improved nutrition, with special emphasis on the protective foods, milk and green vegetables. "By making a proper diet available during the years of growth," they say, "we could eliminate much disease and disability and we could give to the children of this generation the opportunity of 'positive and abounding health' which is now denied to all but a small minority." This, they claim, "is not a task for short-term philanthropy, but for popular endeavour towards a happier and healthier nation." The Children's Minimum Council has kept the public alive to the problem of malnutrition, and it has succeeded in mobilizing a strong body of support behind its proposals for bringing an adequate supply of milk within reach of all children, for extending the provision of school meals, and for raising the allowances for the children of the unemployed. In these directions it has already made some headway, but much more remains to be done. The council's object is "to ensure that no child shall, by reason of the poverty of its parents, be deprived of at least the minimum of food and other requirements necessary for full health." All those who accept its aim are asked to associate themselves with a movement to ensure the foundation of physical fitness. Copies of the pamphlet can be obtained, free of charge, from the Children's Minimum Council, 72, Horseferry Road, London, S.W.1.

The views of the medical profession on the importance of a safe milk supply to the national health were conveyed by a deputation representing medical organizations, which was received by the Minister of Health and the Parliamentary Secretary to the Ministry of Agriculture on Wednesday, February 8. The organizations represented were the British Medical Association, the Royal College of Surgeons, the Royal College of Physicians, the Society of Medical Officers of Health, and the Joint Tuberculosis Council.