Current Literature.

FAIRLEY, N. HAMILTON. **A Note on the Treatment of Sprue with Special Reference to a High Protein Milk Powder.** *Trans. Roy. Soc. Trop. Med. and Hyg.*, 1932, xxv, 297.

In this investigation, which was undertaken under a special grant given by the Colonial Medical Research Council, the author states that evidence is steadily accumulating that sprue is a disease of the gastro-intestine characterized by the deficient gastric secretion of both HCl and Castle's bone-marrow stimulating factor, as well as by malabsorption of fats, glucose and calcium in the small intestine. The basis of the gastro-intestinal derangement may represent either a metabolic breakdown or originate from some obscure infective agency involving the alimentary canal.

Sprue being essentially an alimentary disease, the theory of vitamin deficiency or monilia infection is no longer tenable as the primary ætiological factor, and the author considers that sprue is best treated by measures designed to rest the gastro-intestine. He gives three essentials for this :—

(1) The institution of alimentary rest by appropriate dietary.

(2) The treatment of megalocytic anæmia if present.

(3) The reinforcement of demonstrable deficiencies by such means as HCl, calcium and vitamin D.

The patient should be put to bed both in the initial attack and during relapse so as to ensure mental and physical rest. Patients recently returned from the tropics are especially to be guarded against chills.

Alimentary rest is the ideal aimed at, therefore overloading the stomach must be avoided, and this is best effected by non-bulky feeds at short intervals. Fats must be restricted and carbohydrate intolerance closely watched for. Severe relapses are often due to dietetic indiscretions precipitating attacks of acute enteritis. "Probably deficiency of the di-saccharide enzymes in the *succus entericus* associated with malabsorption of glucose leads to abnormal mono- and di-saccharide residues in the gut and so affords a basis for the excessive carbohydrate fermentation so characteristic of this disease."

The opinion of the author is that it appears rational to make protein the chief constituent of the diet, commencing with one of low calorie value and gradually increasing its quantity while still maintaining as a constant the high protein ratio, and these are the underlying principles on which the high protein, low fat, low carbohydrate diet has been evolved.

In 1930 the author reported on the successful results that followed

the employment of a high meat protein, low fat and low carbohydrate diet, which have since been fully confirmed.

In the present article are recorded the results obtained with a dried high protein milk powder, now available under the trade name of "Sprulac," containing a similar ratio of protein (1·0), fat (0·3) and carbohydrate (1·3) as that advocated by the author in 1930.

The ratios of protein, fat and carbohydrate in a normal diet recommended during the Great War by the Royal Society Committee were 1·0, 1·0 and 5·0, and these are compared in a table with cows' milk, buffaloes' milk and with Sprulac. The comparison shows that both cows' milk and buffaloes' milk, largely used in the tropics, contain a larger proportion of fat than that indicated under a normal diet. If a patient takes five pints of cows' milk daily the quantity of fat is in excess of the 100 grams advocated for a healthy man on a balanced diet of 3,300 calories.

It is evident from Aggarwala's analysis (given in the paper) that even three pints of buffaloes' milk may contain an excess of fat. Thus a sprue patient may be given more fat than a man doing a moderate amount of muscular work.

Owing to the two disadvantages of milk, especially in the tropics, viz., high fat content and invariable contamination, the author considered the possibility of the production by a commercial firm of a stable dried milk powder with a suitable protein, fat and carbohydrate ratio, for trial in cases of sprue at the Hospital for Tropical Diseases, Endsleigh Gardens.

The diets, in which the amount of Sprulac and other constituents are varied, advocated by the author in cases of sprue, are given in five tables, and the conditions under which these are changed are indicated. Liver extract is given in full dosage whenever megalocytic anæmia is present, and acid-hydrochlor. dil. and calcium lactate are administered if indicated biochemically.

In this report the results of treatment with Sprulac and liver extract are considered in ten consecutive cases. The average stay in hospital of these cases was 54·4 days.

Occasionally the monotony of the diet was complained of, but this was invariably overcome.

The effect on weight was that during the early stage of treatment this was reduced, but weight was gained when the later diets were reached. The average gain in weight of patients was eight pounds during their stay in hospital, and a considerable gain in weight has been invariably found at a later date.

Two typical cases are described in detail, and the hæmatological findings, on admission to hospital and discharge, in cases treated with liver extract (ex-hepa) and Sprulac are tabulated. This table shows an average gain in R.B.C.'s of 1,750,000 per c.mm., and in hæmoglobin of 20·2 per cent, with an average decrease in diameter of corpuscles from 7·9 to 7·6 microns (normal), while the colour index changed from 0·94 to 0·8. These findings compare

very favourably with those reported by the author in 1930 in seventeen cases, with fifty-three days in hospital, treated with high meat protein, low fat, low carbohydrate diet and liver extract.

The summary and conclusions of this paper are :—

(1) A preliminary report is made on the dietetic value of a high protein milk powder (Sprulac) in the treatment of sprue.

(2) This powder has been specially prepared so that the ratios of protein, fat, carbohydrate are 1·0, 0·3, 1·3.

(3) Though the alimentary features are not always as dramatically relieved as with a high meat protein, low fat, low carbohydrate diet, the end-results have been uniformly satisfactory in all cases.

(4) Provided adequate quantities of liver extract are administered, blood restoration proves equally rapid whether a high milk protein or a high meat protein dietary is adopted.

(5) Sprulac should have a special field of usefulness in the tropics, where good quality meat in a satisfactory condition is often unprocurable, and where milk, owing to its high fat and bacterial content, frequently proves an unsuitable diet for sprue cases.

ARMSTRONG, RICHARD R. **Immediate Pneumococcal Typing.** *Brit. Med. Journ.*, 1932, i, 187.

Determination of the type of pneumococcal infection is an essential preliminary to the administration of concentrated anti-pneumococcal serum, and this was described by the author and Johnson in the *British Medical Journal*, 1931, i, 931. The author of the present paper published in 1931, in the same journal, an account of a rapid method by which pnuemococcal types could be determined within four hours. This method consisted in the intraperitoneal inoculation of a mouse with the patient's sputum ; by the microscopic examination on a slide of fresh mixtures of the peritoneal contents mixed with type-specific agglutinating sera, the type could be ascertained.

It is stated that a number of tests made during the past winter have proved, without exception, that the type can be decided with ease and certainty by "direct test" on the patient's sputum, without recourse to mouse inoculation.

The following is Armstrong's procedure :—

A suitable fleck of sputum is selected. Three samples of this are placed, equidistant, on a microscope slide, and numbered 1, 2 and 3. With a platinum loop each sample is emulsified with four times its volume of corresponding diagnostic serum. After the application of cover-glasses the slide is set aside for a few minutes ; meanwhile a further sample from the fleck of sputum is smeared on a slide, fixed by heat and stained by Gram's method. The general bacterial flora of the sputum and the number of pneumococci present are seen at a glance in the stained film, which exactly

represents the characters of the sputum samples selected for the diagnostic test. Information as to the character of these should be obtained in advance, as if the pneumococci are numerous a positive result in the typing will be at once seen. If there is no reaction, as, for example, in the case of a Group IV infection, no time should be lost in a useless search.

Using a 4-ocular, $\frac{1}{6}$-inch objective, and plane mirror, with the condenser removed, the slide with the fresh emulsions of sputum and specific sera is examined. The result, in the case of a positive reaction, is a conspicuous increase in the size of the individual pneumococcus, due to conjugation of coccus and homologous antibody, whereas, in a negative test, the unstained pneumococci, when present in small numbers, are just visible. Enlarged cocci have a ground-glass appearance, with a highly refractive peripheral zone. A positive reaction is sometimes apparent to the naked eye. Also when compared with its companion on the same slide (controls) it is seen to be opalescent, due to great increase in size of the "sensitized" cocci. When the pneumococci are thickly coated with sero-mucinous pneumococcic secretion, the characteristic appearances develop more slowly as the specific serum soaks through, and in such cases twenty minutes may elapse before full completion, although the type may be distinguished much sooner by the change in free floating pairs. Type is decided independently of actual agglutination, which is apparently prevented by the viscous nature of the sputum.

The author, in a commentary, states that the results of "direct test" have been confirmed in every case by mouse inoculation and other more deliberate methods used in the laboratory. The test has proved trustworthy and is extremely simple and swift. He is of opinion that since animal inoculation is no longer necessary and a knowledge of bacteriological technique is not essential for carrying out the test, the objection that pneumococcal type cannot be decided in general practice now disappears.

Immediate typing of late cases of pneumonia is described as a matter of minutes, owing to the more profuse sputum and more numerous pneumococci. No time is thus lost in the intravenous administration of serum to the patient.

More care, however, is required in cases of early pneumonia, when the sputum may be scanty and the pneumococci few, and in these a second examination may be necessary.

The author states that type may be decided with equal care and speed by the direct method in the case of cerebro-spinal fluid, empyemata pus, aural discharges, etc.

The usefulness of the test is confirmed by R. Sleigh Johnson, who, in conjunction with the author, is carrying out the diagnosis and serum treatment of lobar pneumonia, and the Medical Research Council is assisting the inquiry.

LOGAN, W. R., and SMEALL, J. T. **A Direct Method of Typing Pneumococci.** *Brit. Med. Journ.*, 1932, i, 188.

This paper follows Armstrong's article, referred to above, and the authors state that they fully agree with him that his microscopic method is superior to other rapid methods and particularly to the macroscopic-agglutination technique. They are of opinion that it is only in the case of pure cultures free from cells that the macroscopic method has advantages.

The authors have typed about 170 specimens of sputum from cases of lobar pneumonia during the last twelve months. They used various methods in each case and always confirmed the result of the direct test by isolating the pneumococcus and determining its type when obtained in pure culture. Their object in the present paper is to show that the phenomenon makes it possible in some cases to recognize the type of pneumococcus by a direct test with the sputum emulsion, and they state that it is possible in some cases to do this within a few minutes of receipt of the specimen.

Their technique is essentially that of Armstrong's.

Sixteen specimens of sputum were tested from cases of lobar pneumonia and a provisional opinion noted prior to the mouse test and the isolation of the organisms for typing in pure culture. Five proved to be Type I, ten Type II, and one Type III. A direct test was also carried out with pus from an empyema due to Type I pneumococcus, and with the purulent cerebro-spinal fluid from a Type II pneumococcal meningitis. The agglutinating serum had a titre of between 1/20 and 1/40.

Details of the results of the direct tests are given :—

Of the Type I cases (5), two were correctly diagnosed by the test; two were thought to be probably Type I; and in the other no recognizable pneumococci were seen either by the direct method or in the mouse peritoneal exudate four hours after inoculation.

Of the Type II cases (10) seven were correctly labelled by the test. Of the remainder, one was thought to be *probably* Type II, one reacted to both Types I and II serum, and the other showed no pneumococci, nor were any seen in the mouse peritoneal exudate four hours after inoculation.

In the Type III case, at first no pneumococci were recognized. The original specimen was re-examined when the mouse method had shown it to be Type III infection, and pneumococci with enormous swollen capsules and sharply defined, rather crenated, outlines were seen in the Type III mixture. The sputum was old when examined the second time, and no pneumococci could be recognized in the other serum mixtures or in the control.

The Type I empyema specimen and the purulent cerebro-spinal fluid from the Type II meningitis were both readily typed by the direct method. Both were confirmed by isolation and typing of the organism.

The authors do not suggest that the direct test is applicable in all cases, or that it should supplant the more reliable methods. They state that the

test requires some bacteriological experience and would be quite unsuitable in a side-room. [This opinion is at variance with the view expressed in the previous paper by Armstrong.] They mention the possibility of the inexperienced mistaking small yeasts, starch granules, etc., for swollen pneumococci, while a normal Type II pneumococcus might be mistaken from a swollen Type I or II. The test is thought to be of value to the bacteriologist, because, if definitely positive, it may help the patient by its rapidity and obviate the necessity for the bacteriologist to visit his laboratory at inconvenient hours. They emphasize the necessity of confirming the result in all cases by a more reliable test, including the isolation of the pneumococcus and the typing of a pure culture.

Reviews.

TOWARDS NATIONAL HEALTH. By J. A. Delmege, O.B.E., M.R.C.S., L.R.C.P., D.P.H. London: William Heinemann (Medical Books), Ltd. 1931. Pp. xiv. + 234. Price 21s. net.

In this volume the author tells the story of health and hygiene in England from Roman to Victorian times, with a brief preliminary account of hygiene in earlier civilizations. The reader will be struck by the high standard of public health measures under the Romans. Their fine schemes of town planning and housing. Magnificent water supplies; with a larger allowance per head of the population than is found in any modern capital. Their baths, water and sun; and their system of central heating, superior to our steam heating of to-day. Yet in spite of all this a Roman boy of 15 had an expectation of life of only 20 years, compared with the 45 years of a modern English boy of the same age. The difference, as the author points out, probably being due to the failure of the Romans to cope with epidemic disease. Then follows a long chapter on the public health in England during the Dark and the Middle Ages, with their long catalogue of plague and pestilence; and so the narrative proceeds, century by century, becoming more detailed as we approach modern times, and finally ending with the Public Health Act of 1875.

The primary object of the book is to instruct, but it is infinitely more attractive and enjoyable than the majority of books written professedly to entertain, and holds the reader's interest from start to finish. The style is delightfully easy, and the author seems never to repeat himself in his successive accounts of similar happenings. Whether he avoids this literary difficulty by reason of some natural gift for narration, or whether his art is so finished as to conceal itself, the reviewer cannot tell. Certainly there is no trace of any studied "elegant variation."

The interest of the book is much increased by the inclusion of nearly a hundred illustrations, well chosen and excellently reproduced.